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Rubber Survey in the Right Hands

THAT automobile manufacturers are not to attempt the rubber survey is a matter for congratulation. If tire fabrics suddenly doubled in price, appeal would not be made to them, but to the cotton men. They of course have an interest in rubber and cotton as tire buyers, but they are equally interested in iron, steel, paint, varnish, and a dozen other commodities. Their specific field, however, is motor vehicles, and they have their own organization to represent them. In the past they have scrupulously refrained from doing anything that would cramp the work of the friendly and efficient Rubber Association, and they still seem of that mind.

The appointment, therefore, of a Rubber Survey Committee by the Rubber Association of America in response to Secretary Hoover's invitation, is eminently fitting and timely. The committee, under the chairmanship of H. Stuart Hotchkiss, represents to an unusual degree the rubber manufacturing, planting, and importing interests. For fifteen years past the larger companies, notably The United States, Goodyear, Goodrich, Firestone, Mason, Miller, and General rubber companies, have been vitally interested in both wild and planted rubber sources. Theirs has been more than an academic interest. It has taken the form of great plantations, together with investigations of planting and planting conditions throughout the Far East, including the Philippines, and, to a degree, in Central and South America. It has resulted in the establishment of expensive laboratories and testing stations in the tropics and in the United States—in the employment of expert planters, botanists, mycologists, and engineers. The results form voluminous reports which in the past have been kept as semi-secret records, useful only to the individual companies by whom they were created. The Rubber Association through its newly appointed committee indicates that all of these records are at the service of the committee.

For the first time Congress has appropriated money for rubber uses and the committee will be supplied with all funds necessary for exhaustive examination and necessary experiment. In view of the millions that Great Britain has spent in past years for the same purpose, America is very tardy. The present appropriation, however, the ability of the committee, and the intimate knowledge that it has of conditions will doubtless result in accomplishment equal to any yet recorded.

Rubber Pavement Promise

RUBBER producers the world over yearn for a new and a great outlet for crude rubber. Something that will parallel the pneumatic tire, for example. In the last ten years nearly the whole industry has been scanned and every type of propaganda employed to bring about conditions that made rubber reach the $3.00 mark. While much has been done, the results in no way suggest uses in any way comparable with that of tire manufacture.

A recent development, however, in bridge work looms large. It will be recalled that some years ago the troublesome vibration in the Goethe Bridge, Hanover, Germany, was corrected by the use of rubber pavement. Now comes the problem of rebuilding Harvard Bridge, connecting Boston and Cambridge, Massachusetts, at a cost of $7,000,000, or of making it secure and vibrationless at the cost, say, of $500,000. Undoubtedly the latter plan will prevail. Once this is accomplished other great bridges, passenger and railroad, will find it economical to follow suit. It is possible also that the elevated systems in New York, Chicago, and Boston will adopt rubber cushioning devices that will greatly lessen vibration, save in upkeep, and be a god-send to adjacent property owners.

The rubber roadway, thus introduced because of necessity, would utilize thousands of tons of rubber annually. Once its value as a vibration killer and a sound silencer, together with its wonderful durability, is generally appreciated rubber pavements about hospitals, hotels, churches, business blocks and private residences will be assured. Pavements may one day use more rubber than motor tires.

High Rubber or Low Rubber

Just as hardship strengthens moral fiber and necessity fosters invention so high-priced rubber has been of incalculable service to the rubber trade. The development of the vast business of rubber reclaiming; the successful use of specially prepared mineral rubbers; the solution of the problem of the use of organic colloids such as glue; the discovery of how to use many unusual types of rubber, as guayule; the production of synthetic rubber and accelerators, and the whole intricate science of scientific compounding, are based upon high priced rubber. One might go even further and claim with justice that manufacturing efficiency, labor-saving machinery, and sane and businesslike marketing may be traced back to the same potent cause.

It should not be forgotten, either, that the tremendous progress in rubber planting in the Far East was due wholly to high priced rubber and the big dividends paid. The fact that overproduction ensued and a long interval of low prices, the lowest ever known, was due primarily to the former excessively high prices.

The triumph of Hevea planting, however, practically wiped out the great wild rubber industry in Central and South America and Africa. In other words, millions invested in *seringals*, in river transportation, in warehouses, were destroyed. Thousands of natives depending upon rubber gathering for their livelihood were thrown back into the direst poverty; millions of dollars spent by Americans in Castilloa plantations were lost because they could not compete. The great business of guayule extraction with its invested millions ceased to function. The reclaimed rubber industry, that practically saved rubber manufacture in the United States when the crude rubber was scarce, hardly survived. Mineral rubber and organic plastics for which there was once an excellent market were temporarily, at least, unsalable and the flourishing business of tire repairing sagged off until it was but a shadow of its once robust self. It should also be recalled that the great rubber extraction plant at Goebilt, Borneo, was made a total loss by cheap plantation rubber.

Years ago when rubber manufacture was young and exceedingly profitable the Boston Belting Co. instead of paying out all of its earnings in dividends created a big surplus, invested in sound interest-bearing bonds. Later, when for a time profits almost disappeared, dividends were paid from the earnings of the surplus. The rubber planters made profits greater than any that history of the rubber industry affords. Most of them could have accumulated surpluses sufficient to carry them through any period. Had they done this no Stevenson plan would have been necessary.

Low rubber has in reality been very much to the advantage of rubber planters. It has operated to cut needless expenditure in plantation administration, to weed out unnecessary salaried officers and middle men, to rest trees that were being overtapped, and to bring about an infinitely better product.

So, too, low priced rubber is one of the greatest impulses for growth that the rubber trade may experience. It is safe to say that with Pará rubber at ten sents a pound oil cloth, linoleum, and oiled fabrics would abandon the use of linseed oil for that infinitely better covering material, rubber, while cellulose products and synthetic resins would largely be dispossessed by hard rubber. It is doubtless true also that an infinite variety of leather goods would be supplanted by those made of rubber and fabric.

Thus high prices are to the advantage of many, low prices to others. This being the case it would almost seem that it would be a disadvantage to the rubber trade to have the price of crude rubber stabilized. Should not the ocean of commerce to remain sweet, clean, and wholesome, have its flood and ebb tides rather than become a a stagnant pool? At all events, as no human power has controlled the ocean tides nor those of commerce except spasmodically, does the future actually hold out any promise of price stability in crude rubber? If the past is a criterion, the next twenty years will see both two dollar rubber and ten cent rubber.

Japan Seeking Hollow Ball Trade

Hollow rubber balls and various kinds of rubber toys valued at $624,000 were exported from Japan in 1921, and the chances are that this total will be much higher for 1922. The sales were made chiefly in the United States, British India, Great Britain, Australia, Canada, China, Dutch East Indies, New Zealand, and South American countries. Most of the rubber toys imported by the British in 1920 were supplied by Japan (over 52 per cent of the total), the value of the Nipponese goods purchased being £47,433, as compared with the total value of this trade, £76,461. During the same period the United Kingdom bought from the United States rubber toys valued at but £10,511; from Austria and Hungary, £8,033; France, £5,945; and other countries, £4,526. In extenuation of such an adverse showing it may be claimed that the rubber articles sold abroad by the United States manufacturers were of superior quality; but the fact remains that the Japanese rivals scored higher in total sales.

"Better Is A Little With Righteousness Than great revenues without right." Proverbs 16:8.

Brazil An Ideal Rubber Planting Country

Home of the Hevea Best Place for Its Cultivation

BRITISH restriction of crude rubber production has revived widespread interest in American rubber planting. Investigations, both governmental and private, of the principal sources of rubber supply, of plantation possibilities in various countries, and of numerous associated matters are already under way. The Philippines and South and Central America are the most promising rubber producing regions being generally discussed. Of them all, the really ideal place for rubber planting is the Amazon Valley of Brazil, the natural home of the *Hevea brasiliensis* and the original source of seed for plantation rubber in the East.

Natural Conditions Favorable

So far as nature can provide, conditions are favorable. Vast areas of forest land and abandoned clearings await development. The climate is right in respect to temperature, rainfall and humidity. The rich soil is inexhaustible and needs no fertilizer ever. Plenty of seed is available and there are no Hevea diseases of any moment. There are no high winds and no droughts.

Legislative Reforms Needed

Brazil will undoubtedly welcome American capital for rubber planting in the immense areas of fertile land at the mouth of the Amazon. And if she will admit coolie labor, abolish import taxes on plantation equipment, and assess only a moderate export tax on plantation rubber instead of the present 23 per cent, with a guarantee for a sufficient term of years, Hevea rubber may again bring prosperity to the great reaches of the most fertile country in the world, and Pará may once more rival Singapore as a rubber market.

Rubber Areas of Brazil

An Early Advocate of Brazilian Planting

Since the first plantings in 1906 THE INDIA RUBBER WORLD has been an advocate of Brazilian rubber cultivation and from that time to date has kept its readers fully informed of every important development in this direction.[1] In an address at a banquet tendered to him at Pará in 1910, the Editor of THE INDIA RUBBER WORLD expressed himself on this subject in the following significant remarks, which appear on page 240 of our issue of April 1, 1910:

Placed at the entrance of the greatest waterway of the world, a river that no engineering skill could dam or bridge, a river which with its affluents drains thousands of square miles of the most fertile portion of the earth, it (the city of Pará) has a vast possible commercial significance and importance. This is particularly true today, for this country stands upon the threshold of an enormous industrial development. Whether or not those present live up to their opportunity will make little difference. The world demands rubber and scores of other staples that Brazil can produce better than any other, and what the world wants, it gets.

The United States of America and the United States of Brazil are twin republics joined by a broad elastic band that cannot be severed. The more you produce, the greater grow our industries; the more we manufacture, the richer you become. I am looking forward to the day when from Matto Grosso to the Guianas, from Santarem to Salinas, the state of Pará will be one great plantation, much of it in rubber.

It is obvious that had the opportunity then presented been seized and made the most of, Brazil would have kept pace with the East in rubber culture and the crude rubber situation today would be very different.

Advantages of the Vicinity of Pará

The accompanying map, reprinted from our issue of April 1, 1913, shows the boundless areas of self-planted Heveas in the valleys of the Amazon and its numerous great tributary rivers, and also shows the sources of other Brazilian rubbers. Particular attention is directed to the immense forest areas about Pará, regarding which the following is a partial quotation from "The Rubber Country of the Amazon," by Henry C. Pearson:

Although in itself the greatest rubber shipping port in the world, the immediate vicinity of the city of Pará seems never, except by the few better informed and more far-sighted than others, to have been considered seriously as a factor in the production of plantation rubber. Nevertheless, this district possesses advantages and opportunities afforded by none other.

The city's proximity to the sea and its natural advantages as a port are so well known and its advantage in this respect over up-river points, where higher freights would be unavoidable, are so apparent that they may be passed over. Then Pará possesses a railroad of 250 kilometers (155 miles) in length, which affords access (ignoring the still much too prevalent belief that Hevea delights in wet and swampy locations) to a tract of well drained and healthful territory, immune to the caprices of annual floods, which is capable of producing a grade of rubber comparable to any now coming from the Amazon valley. This territory was personally inspected by the writer with the express purpose of investigating its suitability for rubber culture.

This section, speaking of the more accessible portion south of the river, forms part of the great forest system of the lower Amazon and extends in an unbroken stretch, practically without variation, eastward to the sea and southward to the mountains. The formation is a typical tropical rain forest. The large trees, among which are some veritable giants, stand comparatively far

[1] During the winter of 1909-10 The Editor of THE INDIA RUBBER WORLD visited Pará, attended the Rubber Congress at Manaos, 1,000 miles further up the Amazon, and made a comprehensive first-hand study of the entire rubber situation and possibilities in the Amazon Valley, which have changed but little during the intervening years. A detailed account of this survey was published in a series of articles in THE INDIA RUBBER WORLD, beginning May 1, 1910, and afterward as a book, "The Rubber Country of the Amazon."

apart and represent almost innumerable species. The undergrowth is somewhat more compact; the small trees are straight and slender, while the whole is intertwined with vines and made practically impenetrable.

In this forest the rubber tree is no exception to the general rule, as it is scattered and found in isolated locations like the other native species. The large size of the specimens found, however, even when in competition with other and oftentimes more vigorous denizens of the forest, testifies to its adaptability to its surroundings.

Labor does not present any unusual difficulties near Pará, nor are the forests difficult to remove. Raw labor is available in almost unlimited quantities near the city. It is easy also to import men from southern Europe and the Madeiras, a class which rapidly accustoms itself to the climate, which is not at all unhealthful, especially in the higher districts away from the vicinity of the rivers.

A Review of Rubber Planting in Brazil

British initiative and enterprise have made plantation rubber chiefly a British industry. While comparatively little planting has been attempted in Brazil, enough has been accomplished to indicate its feasibility and to furnish a basis for larger operations. The fact remains, however, that though the extensive planting of Hevea in Brazil has long been urged by a few far-sighted individuals, the project has been looked upon with disfavor by the majority.

Hevea Planted on Tapajos Plateau

It was believed that in Brazil the trees did not become productive until they were between 20 and 30 years old, which idea arose from the fact that those who did attempt to cultivate Hevea planted in the shade of the forest where the trees grew very slowly, and when finally ready for tapping were often spoiled by the use of the *machadinha*. It was further believed by many that plantation rubber would later take the place of the wild product. The great shortage of labor was another drawback, proprietors of the *seringals* very frequently being unable to procure enough laborers to collect the wild rubber.

The first news of results obtained on eastern plantations was received somewhat skeptically in Brazil, but on the advice of a few well-informed men the government soon began to devote some attention to the problem of cultivation. In 1906, Augusto Montenegro, who was governor of Pará at that time, opened a station for agricultural experiment near Peixe Boi, and here a small area was planted with *Hevea brasiliensis*. The same governor was instrumental in publishing a pamphlet recommending Hevea cultivation and giving advice as to practical methods of planting. Under the governor next in office, Dr. Joao Coelho, the work made considerable progress, and in 1909 the Department of Agriculture planted a number of acres with Hevea by way of experiment. Another government plantation was established the following year at Marituba. Just outside the city of Mañaos is an experiment station, where thousands of Heveas planted in partial shade in paths cut through the jungle were in 1911 growing well, but slowly.

Hevea Planted by Henry C. Pearson at Mañaos

Early Commercial Efforts

Prior to this, several British companies had become interested in planting Hevea in the Amazon Basin, and several small estates of two or three thousand trees have been established by local merchants.

During 1909 and 1910 the industry became more active and some large companies (English, French and German) were established along the lower Amazon and in the island region. On some of

these plantations many thousands of trees are reported to have been planted. One large operator in the Acre district was said to have planted 100,000 trees previous to 1911.

Plantation Enabling Legislation

In 1910, a general policy was adopted by the states of Pará and Amazonas, authorizing their respective governors to make contracts with various companies, either Brazilian or foreign, for planting Hevea, and making free concessions of land up to 20,000 hectares. A reduction of export and freight taxes on plantation rubber was also conceded, and free transportation by rail or water granted for all materials and live stock for cultivated rubber estates, together with a guarantee of 5 per cent on the realized capital.

Dr. Huber Tapping Planted Hevea

In return for these concessions the companies concerned were expected to follow the instructions of the State Agricultural Department in cultivation; to plant no less than 20 *seringals* per annum; to cultivate as accessories to Hevea, corn, rice and beans; to furnish annual statistics of the number of plants and their state of cultivation; to establish and maintain a school of practical instruction in agriculture for at least 20 adolescent abandoned boys; to use a trade mark duly registered with the Junta Commercial according to law; and to permit inspection by the government of all its activities.

Premiums, in the form of special exemptions and cash bonuses, were also offered by the State of Pará, which brought about the registration at the Department of Agriculture of many private planters, and in December, 1911, the number of trees planted was reported as 340,000.

First Important Estates

One of the first estates of any size was the Moju plantation, begun in 1910 by Commodore E. C. Benedict. It is located on both sides of the Moju River where the soil is a sandy loam, and comprises several hundred thousand acres, most of which was at that time heavily forested. The estate was placed in charge of a Pará merchant, who had a large portion of the forest cut and burned. Believing that a better tree grew in the Acre district, he imported seeds from that state, and soon had 40,000 Hevea trees planted, besides a large acreage of rice, bananas and cacao.

The Heveas were planted at distances of 15 by 20 feet, and stand in cleared pathways with rows of jungle between, the close cleaning practised in the East not being employed. The labor was performed by about 150 negroes from the West Indies. It is reported that the trees are healthy and have made very good growth.

It was on this estate that Andre Goeldi worked to produce a cover crop that would enable the company to do away with the constant clean weeding of rubber, and his successful work with bunch grass is believed to have solved the problem. No rapid advance has been made of late years and the estate has been left in the hands of a few caretakers.

Another plantation is the Pará (Marajo) Islands Rubber Estates, Limited, on the Anajaz River, about 200 miles from the city of Pará. This company was started about 1910 with English capital, some 50,000 Heveas being planted at that time. During the time that elapsed before the trees came into bearing, some money was made from wild rubber gathered on the estate. Here, as on the Moju estate, a Brazilian manager was employed, and indeed this is the case with most foreign companies, the reason being that while an estate having a foreign manager is assessed about $1,500, the tax where the manager is a Brazilian is not more than $160 annually.

Planted Hevea—Museum Goldei, Pará

A Great Opportunity Lost

An act of the Brazilian National Congress in 1912, intended to improve the unsatisfactory condition and declining position of the Brazilian rubber industry, provided for the exemption of import duties on materials and appliances for rubber cultivation and manufacture, and the reduction of export duties on plantation rubber for a period of twenty-five years; offered premiums for new plantations and prizes for the establishment of rubber refining plants and rubber goods factories; provided for the establishment of government experiment stations and triennial expositions. A few of the proposed experiment stations and washing plants were established, but expansion of the latter idea was deterred by the fact that washed and dried Brazilian rubber never became popular in the market. Otherwise very little was accomplished as a result of the measure. The opportunity thus afforded was neglected and lost. Other less profitable agricultural projects were gone into instead.

Little has since been done although experimental operations were later resumed by the Agricultural Society of Amazonas. Some progress was made under the direction of Dr. Angelino Bevilaqua, who was financially backed by the State of Amazonas. Nursery beds were laid out, a large number of trees planted, and thousands of seeds gratuitously distributed. All told, however, enough has been done to demonstrate the practicability of Brazilian plantation rubber and to provide the nucleus of a great essential industry for those with the enterprise and capital to undertake it.

VULCAFOR

A series of well-known organic accelerators of vulcanization of British origin are being offered to rubber manufacturers under the general trade name of Vulcafor which runs in a numbered series of five, as follows: (1) Accelerine, para-nitrosodimethylaniline; (2) diphenylguanidine; (3) triphenylguanidine; (4) thiocarbanilide; (5) aldehyde ammonia.

American Rubber Pavement Would Save Harvard Bridge

Vibration So Threatens This Famous Structure That a New $7,000,000 Bridge Is Proposed—Experts Planning a Rubber Flooring That Will Render the Present Bridge Safe and Save Millions of Dollars

RUBBER pavement may yet be the means of preserving Harvard Bridge for some years to come, and Boston, Massachusetts, may thereby become the first American city to adopt this most advanced type of street covering which has proved so successful abroad.

Harvard Bridge has long been the most famous bridge structure in New England and one of the best known in the country. Spanning the Charles River Basin from Boston to Cambridge, home of Harvard University and the Massachusetts Institute of Technology, it makes of Massachusetts avenue Boston's principal traffic thoroughfare to the north and northwest. Not only does it carry thousands of motor vehicles daily but a busy double-track trolley line as well as considerable pedestrian traffic.

The Harvard Bridge, Boston, Massachusetts

The Present Harvard Bridge Situation

When the bridge was originally constructed, it was not contemplated that the street railway would require a right of way, and therefore, while the bridge was built strong it was not constructed in such a manner to withstand the vibration caused by the heavy street cars now in operation. The bridge is not unsafe, but the present flooring is insufficiently supported. The bridge flooring consists of three and one-half to four inches of lumber laid on the supporting timbers. Over this various forms of pavement have been laid, which required some four inches more in thickness, making a total of eight inches above the supporting timbers. The four inches of flooring is not stiff enough to keep the timbers and spans from vibrating as vehicles roll across the bridge, with the result that no form of pavement could be held down on the floor. Wood blocks loosened up within a short time after laying, and the wood strip pavement last tried has now loosened so that the strips now act as a great xylophone on which the wheels of every vehicle crossing play a discordant tune, annoying alike to motorists and residents in the houses on Beacon street and Charles River road nearby.

This undesirable condition has led to the proposed erection of a new $7,000,000 War Memorial bridge, which has many advocates in the city governments of both Boston and Cambridge.

Day Baker Leads the Opposition

Three different bills are now before the Massachusetts Legislature providing for the construction of a new bridge to replace the present structure, all of which have met with considerable opposition on the questions of necessity and expediency.

In this opposition Day Baker, chairman of the legislative committee of the Massachusetts Automobile Dealer and Garage Association, has taken a leading part, and it is his suggestion that by the use of rubber pavement Harvard Bridge be made safe and preserved at a cost of some $500,000, thus saving over $6,000,000. His arguments, based on research by experts, are so convincing that they have won the support of large numbers of motorists and conservative business interests.

A New Bridge Unnecessary and Inexpedient

On February 12, 1923, Mr. Baker appeared before the legislative committee on Metropolitan Affairs in opposition to the Harvard Bridge bills before the legislature. He urged that the state, cities, counties and towns affected were in no condition financially to build any of the proposed structures because of already heavy tax burdens; that with the manufacturing activities of the district 10 to 12 per cent below what they were during the period of previous prosperity, and the state asking for $14,000,000 for highway construction on a pay-as-we-go plan, this is not psychologically a good time to undertake large tax burdens; and that automobile owners, already taxed to the limit, seriously object to bearing their share of the cost of a new bridge.

Rubber Pavement Would Solve the Problem

He contended that the construction of a new bridge is entirely unnecessary at this time, pointing out that the present bridge has in addition to the street car right of way two roadways nearly twenty feet wide, which are ample for the volume of traffic for some years to come and will care for all the vehicles which the

width of Massachusetts avenue will carry. Finally he asserted that at an expense not exceeding two years' interest on the bonds necessary to cover the cost of the proposed new bridge the present structure can be made safe for the present heavy traffic and unobjectionable to property owners along the Charles River Basin by laying a proper strength of flooring and covering it with suitable rubber pavement which would minimize the present excessive vibration of the spans of the bridge.

Advantages of Rubber Pavement

In his arguments he emphasized the numerous advantages of rubber pavement, such as long life, low maintenance, thinness, light weight, non-slipping character, reduction of noise and vibration, which warrant their use even at an advanced cost above wood blocks or other forms of pavement on bridges and certain streets around hospitals, schools, courts, public auditoriums, banking and office buildings where traffic noises are objectionable.

The India Rubber World Quoted

Regarding the successful past and present use of rubber pavements abroad, he quoted extensively from the articles on this subject in The India Rubber World of January and February, 1923, and previous issues. Particular mention was made of the remarkable success of the rubber pavement trials covering upwards of thirty years in London, England; Glasgow and Edinburgh, Scotland; Cannes, France; and Hannover, Germany, as detailed in those articles, and of the extensive rubber pavement laying which has followed. The reduction in vibration resulting from the rubber paving of the Goethe Bridge, in Hannover, Germany, in 1887, furnished a convincing parallel.

Details of the Rubber Paving Plan

A rubber pavement of proper design need not be over two inches in thickness. On Harvard Bridge this would permit laying a six-inch supporting floor, which would so stiffen the bridge construction as to eliminate practically 67 per cent of the vibration, even were a hard pavement used above. This is the opinion of several bridge engineers familiar with this bridge and general bridge construction. They are convinced that by the use of rubber pavement Harvard Bridge can be made a safe and satisfactory highway for some time to come at a saving of millions of dollars as compared with the cost of a new bridge.

Mayor Curley's Interest

At the instance of Day Baker, William G. Martin, development engineer of the North British Rubber Co., Limited, of Edinburgh, Scotland, one of the pioneer rubber pavement manufacturers, visited Boston and through Mayor James M. Curley placed his experience at the command of the city. The mayor manifested much interest and would gladly place himself in the position of pioneer rubber road builder of the United States if he can be convinced of the present feasibility of rubber roadways. As applied to Harvard Bridge, however, the outcome remains uncertain, for the proposed new bridge is a project favored by the city governments of both Boston and Cambridge, which are opposing further investigation of the matter.

Mayor Curley has, however, instructed the Board of Public Works to make a study of rubber pavements for use on hospital and important office building streets. Thus far the investigation makes it apparent that the initial cost of rubber pavements will be higher than of granite or wood blocks, but when the factors of exceedingly long life, low maintenance and noiselessness are taken into consideration, it may be determined that the ultimate cost and the benefits to be derived will warrant the laying of rubber pavements in certain streets and places where their quietness, durability, light weight and non-slipping characteristics are highly desirable.

"Rubber Machinery," by Henry C. Pearson, should be in the library of every rubber company.

American Chemical Society Meeting

The following reports and papers will be presented before the Rubber Division at the meeting of the American Chemical Society to be held in New Haven, Connecticut, April 3 to 7, 1923. All divisional meetings are to occur April 5 and 6, followed by excursions to plants and informal inspections on April 7.

Rubber Division Program

1. Committee Reports:
   - Executive .....W. B. Wiegand.
   - Trade Name Accelerators.....J. B. Tuttle.
   - Originator of Organic Accelerators...E. B. Spear.
   - Physicial Testing Committee .....C. O. North.
   - Committee for Standardization of Test Formulas .....E. B. Spear.
   - Analytical Committee .....S. Collier.
2. W. J. Kelly and K. B. Ayres, "Solubility of Sulphur in Rubber."
3. W. W. Vogt and R. D. Evans, "Poisson's Ration and Related Properties for Compounded Rubber." Lantern.
4. H. L. Fisher, "A Review of Recent Important Investigations in the Chemistry of Rubber."
5. Giuseppe Bruni, "Organic Acceleration of Vulcanization."
6. A. A. Somerville, "Time vs. Temperature of Vulcanization."
7. G. S. Whitby and J. Dolid, "Examination of the Emulsifying Properties of Some Constituents of Hevea Latex."
8. G. Stafford Whitby, "Relations Between the Chemical Character of Liquids and Their Ability to Swell or Disperse Rubber."
9. G. Stafford Whitby, "Notes on the Pyrrole Test as Applied to Rubber."
10. G. S. Whitby and H. E. Simmons, "Studies of Vulcanization Accelerators. I. Experiments with Piperidonium-Piperidyldithio-carbamate. II. Experiments with Various Organic Compounds."
11. Ira Williams, "Use of Selenium in Rubber Compounding,"
12. R. J. Bonstein, "A Method of Measuring Cure by Compression Tests."
13. C. W. Bedford and H. A. Winkelmann, "Reactions of Accelerators During Vulcanization. VI. Action of Litharge and Organic Acids."
14. E. Hopkinson, "L-S Rubber, A New Crude Rubber."
15. S. M. Cadwell and O. H. Smith, "Laboratory Burning Test for Accelerators."
16. J. McGavack, "Substitution and Addition of Chlorine in the Rubber Molecule."
17. G. Ogden, "New Rubber Products from Hydro-Cellulose." (Tentatively on the Program.)

A dinner is being planned for the Rubber Division and their friends in commemoration of Charles Goodyear, to be held on the evening of April 5.

Visit of Prominent Italian Rubber Chemist

Professor G. Bruni, superintendent of the experimental laboratories of Pirelli & Co., Milan, Italy, will arrive in New York early in April. While in America he will be the guest of Yale University, New Haven, Connecticut, where he will attend the spring meeting of the American Chemical Society. Following this meeting Professor Bruni has accepted invitations to lecture at the following places:

April 9, Columbia University, 8:15 p. m., Havemeyer Hall, "Theoretical and Practical Rubber Chemistry."

April 12, Pittsburgh Section of the American Chemical Society, Pittsburgh, "Italy's Part in Chemical Scientific Development."

April 13, Ohio State University, "Italy's Part in Chemical Scientific Development."

Latex-Casein Top Sizing Process

The following interesting letter from Frederick Kaye, the British latex-paper expert, gives further information on the use of rubber latex in paper making.

IN your issue of February 1, 1923, is an article on "Top Sizing Paper with Rubber Latex and Casein," which is said to be a new American process, and you suggest that it may be alternative to my beater method. The writer of your article appears to have insufficient knowledge and experience of my process. The method of treating paper with a top sizing of rubber latex has already been experimented on by myself some time ago and I did not continue the study of the application of the method because it is a method of limited application and is comparatively a crude way of introducing rubber into paper and can never compete in efficiency and width of application with my beater process. This will be seen from the fact that paper top sized with rubber will, on tearing, break away to give exposed films and threads of rubber, showing that the rubber is not intimately co-mingled in the closest association with the minute structure of the fibrous material of the paper.

Where my beater process is used the rubber is never visible as such and can only be seen in the structure of the paper under a powerful microscope. The tearing of a sheet of material made by my process containing even as much as 30 per cent of rubber will not give any films and threads of rubber. This demonstrates how effectively the rubber has become part and parcel of the complete structure of the paper. That is a valuable quality of the process,—the paper character persists unless large proportions of rubber are present, while the rubber in the paper modestly lends its personality in giving a superior finish, texture, feel, and strength.

With regard to the figures given by your correspondent, I have calculated the percentage increase in the bursting strength in the Kraft paper experiments set out on page 284 of your journal, where the paper has been top sized with rubber latex and casein. The average increase is 26 per cent, with a maximum of 72 per cent, and a minimum of 4 per cent. The approximate added weight after treatment gives an average of 4.8 per cent—the maximum is 10 per cent and the minimum is 1 per cent. As the composition of the size is 75 per cent rubber and 25 per cent casein this means that the average increase in weight due to rubber from the top sizing is 3.6 per cent.

I have compared these figures with what I have obtained as to increase in bursting strength from commercial experiments in different mills in England where paper has been made under identical conditions with and without rubber latex on eleven different papers as to quality and furnish. I find that the average increase in the bursting strength of these papers where rubber latex is introduced by my beater method is 35 per cent,—maximum 87 per cent and minimum 10 per cent, while the amount of rubber put into the paper was from 1 per cent to 0.5 per cent, or an average of 0.77 per cent.

That is, with approximately 1/5th of the quantity of rubber latex, the increase in the bursting strength of the paper treated with latex by my process is greater by 30 per cent than for the Kraft paper treated by the proposed top sizing with rubber latex and casein process.

In a further series of experiments on my beater process made by me on a wide variety of furnishes which included nearly all fibers generally used in paper making, I found there was an average increase in bursting strength of 82 per cent,—maximum 200 per cent and minimum 26 per cent. Here the rubber put into the paper varied from 10 per cent to 0.3 per cent, with an average of say 2 per cent.

An examination of the relative costs of the beater process and the top sizing process will show that my process is simpler and cheaper. The rubber latex is added during the ordinary paper making routine and needs extremely little extra trouble and labor, while the top sizing process is another operation after the paper has been made, while the dipping and re-drying from the formaldehyde bath is a third process to be paid for both in material and time.

The writer of your article suggests that the American paper makers have not succeeded very well in their experiments on my beater process and infers this is due to inherent difficulties which the method presents. I regret to learn that all the American paper makers may not have got satisfactory results in their preliminary trials but I hear that some have got excellent results which promise developments in many directions.

The method is quite simple and if the instructions are faithfully followed the results achieved should be uniformly good. It is important that only high grade and perfectly preserved latex should be used; that is, a latex as perfectly fluid as milk and entirely free from any odor due to putrefactive changes.

The fact that a good number of the finest paper mills in Britain have taken up the commercial production of latex paper and are putting on the market increasing quantities of the highest grades of writing, ledger, and printing paper, etc., is positive proof that my process is a workable proposition on a big technical and commercial scale and also that financial profit is realizable even in the early period of development. Every week new quantities of latex paper are being commercially experimented upon and the latest results show that in the manufacture of art paper, grease-proof paper, etc., there are great trade possibilities. Already one mill has decided to devote itself entirely to the production of latex paper of high quality.

Commercial experiments are also going forward in many paper mills in Norway, Sweden, Finland, Denmark, Holland, Belgium, France, Spain, Switzerland, Austria, Germany, etc. The paper makers of Scandinavia, who are known to be amongst the best in the world, are achieving great things in the production of latex paper.

The field for progress with my process in the paper mills of the United States of America is an immense one and I feel sure the rapid advance which is being made in the production of all grades of latex paper in Britain and Europe will urge forward the American paper makers to take up with increasing eagerness the commercial production of rubber latex-containing paper in their mills.

CUMAR RESIN

Cumar is a synthetic resin produced from coal tar distillates, by carefully controlled chemical process. In appearance it resembles ordinary rosin but its properties are radically different. It is uniform in quality and free from foreign matter; is unaffected by water, acids, alkalies or salts, also it is neutral, non-saponifying and non-oxidizing.

Cumar is valuable as a plasticator for tire treads, side-wall and friction stocks, and in heels, soles and cements. For these applications in rubber work three grades are prepared, known respectively as hard, soft, and special low melting point. The last-named is designed for frictions where marked tacky quality is desired. The hard grade has been found an advantageous addition to cement stocks. In specific gravity cumar is low, being from 1.05 to 1.15 and is soluble in all coal tar solvents. Its color is regulated from light yellow to dark amber.

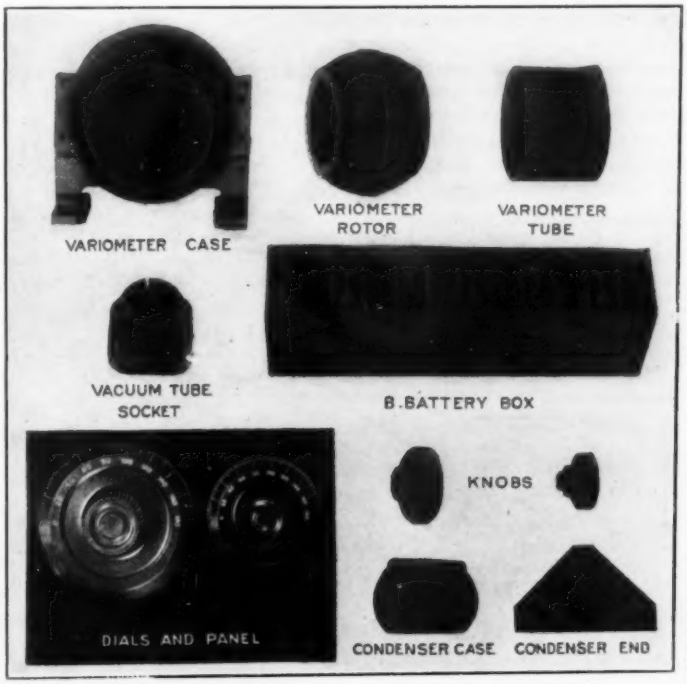
Hard Rubber in Radio Instruments[1]

Phenomenal Demand for Radio Instruments of Quality—Hard Rubber Panels Dielectrically Superior—Workability of Hard Rubber—Molded Instrument Parts

THE unprecedented demand for radio instruments is indicated by statistics which show that during the past year the number of broadcasting stations increased from 80 to 581, and the number of receiving stations from between 600,000 and 1,000,000 to between 2,000,000 and 2,500,000. The number of receiving instruments in operation within a radius of 100 miles of New York City is said to be 500,000, serving a nightly radio audience of more than 2,000,000.

Radio experts are beginning to question the reliability of electrical characteristics based only upon direct current or comparatively low frequency alternating current measurements. Electrical tests made at the tremendously high frequencies of the average broadcast carrier wave require extremely sensitive instruments involving the use of insulating materials which permit the smallest possible electrical losses.

In the present stage of development the tendency in construction of radio receiving instruments is improvement in quality and elimination of mere cheapness of parts. Radio instrument building is stabilizing on quality, and therefore consideration is being given to the special dielectric characteristics of hard rubber as an insulating material for the best sets.



U. S. Rubber Co.

Typical Hard Rubber Radio Parts

The superior insulating qualities of specially compounded hard rubber for radio instrument parts was undisputed for years in the development of wireless communication. It still remains unsurpassed as an insulating material by any of the hard molded plastic compositions, the use of which in molded parts became enormous during the unprecedented rise of radio in popular interest. The principal reason for this seems to be the facility with which the phenolic resin compounds can be molded in highly finished pieces with or without metal inserts. Volume production, rather than absolute superiority of dielectric quality, is naturally the controlling factor from a manufacturing standpoint.

Radio Panels

Some hard rubber compounds are more suitable than others for radio insulations. In general, hard rubber compounds possess in a high degree those characteristics most necessary for insulating materials employed in making radio panels and such molded parts as dials, knobs, sockets, insulators, etc.

It is well known that high frequency currents are difficult to control, and consequently radio receiving apparatus is best when designed and made of materials which permit the smallest possible electrical losses.

Radio engineers have determined that there are four most important characteristics to be considered in panel or other insulating material. These are phase angle difference, dielectric constant resistivity, both volume and surface, and the tendency to absorb moisture.

Phase Difference

Phase difference is a property which expresses the heating of the material and at radio frequency largely determines the radio frequency voltages the material will stand without injury and power loss in insulating parts. It introduces resistance in the circuit and diminishes selectivity. The phase difference should be the lowest possible.

Dielectric Constant

Dielectric constant is an important factor in the material used in making the condenser. It determines the amount of alternating current which flows when an alternating voltage is impressed on the condenser. It also helps in determining how much the condenser heats and the high frequency voltage at which the insulating material is injured.

Surface and Volume Resistivity

Surface and volume resistivity determine the resistance to the passage of an electric current across the surface or through the insulation. The higher the resistivity the better the insulation.

Absorption of Moisture

Absorption of moisture has a most important effect on many of the electrical properties of the material, especially on phase difference and resistivity. Insulating material should therefore absorb no moisture and have a high surface finish to produce the best results throughout all seasons and in climates where humidity is a serious factor.

A hard rubber compound best suited for radio use, besides possessing these necessary electrical characteristics, must be non-porous, non-absorbent, permanent, easily, quickly and accurately molded and machined with ordinary tools without danger of chipping. It must also be low in free sulphur content, and the sulphur must be fixed in the compound so that it will not come to the surface or "bloom."

One of the most successful special compositions of hard rubber

[1] Data contained in this article furnished by The American Hard Rubber Co., The United States Rubber Co., The American Telephone & Telegraph Co., and The Tribune Institute.

designed for radio panels is known as Radion. This material is produced with satin-like finish in black, brown and in a skilful representation of the grain of mahogany. This material ranks high in the four most important requirements for radio insulations. The authoritative tests of Radion are as follows:

1. Low Phase Angle Difference ..... 0.5 to 0.6
2. Low Dielectric Constant 3.9
3. High Resistivity (Megohms-cm) ..... 1.0×10^6
4. Low Absorption of Moisture—
   In Air ..... .005% to .02%
   In Water ..... .08% to .11%

The results show phase difference of ¼, dielectric constant of ½, and absorption of moisture of 1/14 of the same characteristics for phenolic and laminated phenolic materials.

It is interesting to note that hard rubber sheet in the form of panels is practically only half the price of panels made of the various phenolic resin compositions either pure or composite. The reason is that in sheet form hard rubber is vulcanized in very large volume at each curing, therefore notwithstanding the fact that the time of vulcanizing may be several hours, the labor cost of the output is low considered either on a weight or volume basis.

The advantages of employing only the best insulating material in the construction of radio instrument parts is shown in the following quotation from a leading radio engineer.[2]

Current leakage between binding posts or other mounted metallic parts of the set is responsible for a good share of the losses that occur in the receiver. At comparatively low frequencies chemically compounded materials are about on a par with hard rubber in this respect. But at radio frequencies these figures are not at all applicable, for a new phase of the insulator's structure becomes predominant. The leakage in the compounded insulators increases considerably, and the reason which has been advanced is that the structure consists of solid substance in which are microscopic pockets containing more highly conductive material. These pockets act as a series of tiny condensers that at high frequencies form a convenient leakage path.

Workability of Hard Rubber

The workable qualities of hard rubber give it a distinct advantage over any other insulating sheet material used for panels. It may be machined, drilled, cut, threaded, engraved, stamped, sanded, and polished with ordinary tools without danger of chipping.

In large scale factory operations hard rubber is cut with power circular saws of special design. In panel making and similar work satisfactory results are obtainable by using for cutting to dimensions an ordinary hack saw with blade having 24 teeth to the inch. For drilling holes use a straight fluted drill, feeding slowly without great pressure, otherwise the stock may heat excessively and the drill run the hole out of true.

Radio Parts from Sheet Stock

Among the radio instrument parts that may be fashioned easily from hard rubber sheet may be mentioned condenser ends, slider blocks, spider web and honeycomb coil mountings, parts for phone plugs, detector bases, vario-couplers, tube sockets, dials, knobs, and condenser boxes. Variometer tubes can be cut from stock hard rubber tubing, and various small pieces and handles can be turned from hard rubber rods.

Hard rubber is no doubt at once the cheapest and best radio panel material and meets with favor because of these points and the facility with which it can be machined. Where volume production in molded pieces is concerned the advantage of cheapness lies with the various hard molded plastic compositions. It is safe to say that when special parts are needed or highest quality desired hard rubber alone should be used.

Molded Hard Rubber Parts

Hard rubber can be molded into any form in iron or steel molds under hydraulic pressure or in soft metal molds made from a steel matrix. Iron and steel molds are preferable as the molds are more permanent and retain their shape, producing a more uniform article. It is easily worked into special designs either by molding or machining and takes an excellent finish.

A hard rubber molded part of widely extended utility is the case and cap of the telephone receiver. In this application hard rubber is particularly valuable owing to the accuracy with which it can be machined and also to its remarkable sonorescent quality.

Other hard rubber molded pieces used in radio instrument construction are variometer tubes, and frames, condenser bases and tops, slider blocks, spider-web and honeycomb coil mountings, parts for phone plugs, detector and induction coil bases, and a variety of other irregular shapes of special design.

The variometer case is molded in two pieces. These are accurately formed to fit together closely without machinery other than boring bolt holes. The variometer rotor is molded in one piece of suitable size to revolve within the two-piece case. Variometer tubing is made of one-ply hard rubber calendered sheet formed around a mandrel, the edges of the raw stock being united by knitting together the skived edges. Hard rubber tubes and rods are packed in soapstone for curing in open steam. Vacuum tube sockets are made in a multi-cavity steel mold, as are also the B battery box and its perforated cover pieces, also the condenser case or small single piece box with end flanges designed to contain the parts of a fixed condenser.

Condenser ends are made by sawing thin hard rubber sheet into suitable size and dimensions. Dial knobs with graduated dial are molded from steel molds hobbed or engraved to show the dial graduation cut into the finished surface of the dial. The graduation and figures are given distinctness by filling them with white lead paste.

Several of the molded parts named are shown in the illustration. Among those represented the panel and variometer tube are not molded but are made from calendered sheet stock.

Standard Panels

Hard rubber panels are sawed from vulcanized sheet, the standard size of which is 20 by 48 inches made in bright-tin finish, which is secured by vulcanization between planished sheets of tin. Panels for radio receiving sets should be true, square cut, and edges ground true.

Following are the usual stock sizes of 3-16 inch hard rubber panels for the amateur builder of receiving sets.

7 x 10	7 x 24
7 x 14	10 x 12
7 x 18	12 x 14
7 x 20	12 x 18

Simple Tests for Hard Rubber Quality

Hard rubber is made in many grades and the quality can be easily judged by the toughness of the shaving and by the facility with which it cuts and machines. The easier it machines the better the quality and the more readily it takes a black high polish.

As interest grows in radio reception from far distant stations, and the application of the theory of radio frequency becomes correspondingly more general, the importance of protecting all apparatus against slight leaks and losses, due to ineffective insulation, is more and more appreciated. This condition will gradually bring about the use of panels, dials, and other parts having smooth polished surfaces free from small pits and furrows, and having unusual freedom from inherent and surface moisture.

A COMPARISON OF TIRE EXPORT STATISTICS COMPILED BY THE Rubber Association of America, Inc., with the official customs returns for 1922, shows that, roughly, 75 per cent of the exports are reported to the Rubber Association. Of this 75 per cent the proportions of metric sizes exported are: casings, 24 per cent; tubes, 14 per cent; solid tires, 20 per cent. During December shipments in excess of the official customs returns were reported by the Rubber Association, and the indication is that January official returns will show a healthy increase in foreign shipments.

[2] Ralph K. Potter, Radio Engineer, Tribune Institute, New York, N. Y.

The Aftermath of Rubber Restriction

The Firestone Conference—Government Interest Aroused—Appropriation for Inquiry—Rubber Association to Cooperate—President De Lisser's Statement—Planters' Viewpoints

The Firestone Conference

Believing that matters in connection with rubber restriction were reaching a crisis, Harvey S. Firestone, president of The Firestone Tire & Rubber Co., extended an invitation to all rubber, automobile and accessory manufacturing companies in the United States to be present on February 27-28 at a conference to be held in the New Willard Hotel, Washington, D. C. The invitation stated that the conference was to deal with the question of the rubber restriction act, and also to discuss the movement under way for investigating sources of crude rubber supply other than British.

The morning session was called to order by Mr. Firestone in a brief address which outlined the purpose of the conference. Following this A. C. Miller, of Miller, Gorman, Wales & Noxon, Chicago, Illinois, rehearsed by means of a carefully-prepared paper "The History and Effect of the British Crude Rubber Restriction Legislation." Taking as his subject "The Philippines as a Source of Rubber Supply," Major George F. Ahern, Former United States Director of Forestry for the Philippine Islands, then reviewed his own investigations and those of others, after which Roy C. Brown spoke of the possibility of "Rubber Growing in Hawaii."

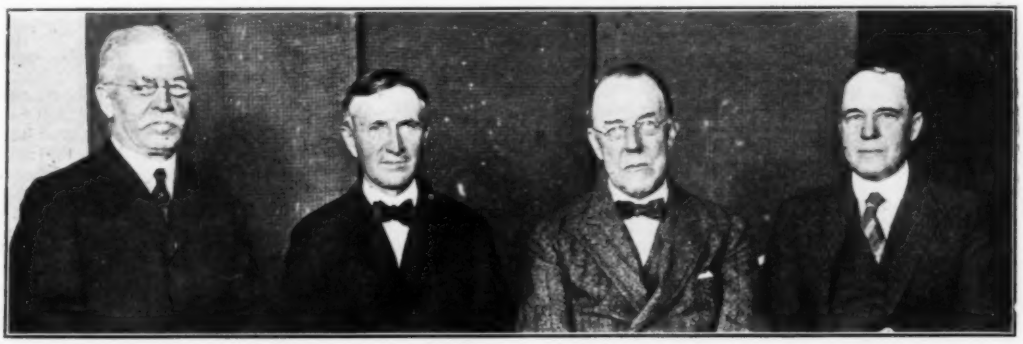
The opening address of the afternoon session was made by Major General Frank McIntyre, Chief of Bureau of Insular Affairs, U. S. War Department, who took as his subject "Opportunities for Rubber Production in the Philippine Islands." Much interest was shown in the plan outlined in a brief address by Hon. Henry C. Wallace, Secretary, U. S. Department of Agriculture, concerning "The Possibility of Growing Rubber in Continental United States." "Rubber Growing in Central and South America," as suggested by Franklin H. Adams of The Pan-American Union, formulated still other interesting projects. Philip H. Lockhart, past-chairman, W. & A. Bates, Limited, Leicester, England, and also past-chairman of The India Rubber Manufacturers' Association, Limited, of Great Britain, then spoke on the "English Rubber Manufacturers' Attitude Toward Rubber Restriction Legislation," his address being followed by a few words from Hon. Medill McCormick, U. S. Senator from Illinois, concerning "Monopolistic Control of Rubber Production." The meeting concluded with an address by W. H. Smith, of the Ford Motor Co., Detroit, Michigan, who spoke on "Results of Economic Research of Crude Rubber Supplies."

At the dinner following the conference the chief speakers were Hon. Simeon D. Fess, Senator-elect from Ohio; Hon. James Couzens, Senator from Michigan; and Hon. C. H. Huston, assistant secretary, Department of Commerce.

Resolutions were adopted favoring investigations of new sources of crude rubber supply, and that a committee of five be appointed to cooperate with the Department of Commerce and Agriculture in the carrying forward of such investigations. Resolutions were also adopted protesting against the rubber restriction laws, and providing that a committee be appointed to cooperate with British rubber manufacturers and other countries of the world in presenting this protest to the British Government for the purpose of securing the repeal of the restriction legislation.

Government Appropriation for Inquiry

As a further step and indicating the gravity of the situation the United States Government later agreed to appropriate a total amount of $500,000, of which $100,000 will be used in making an exhaustive survey regarding present conditions in the rubber industry and the possibilities of developing new sources of rubber supply independent as far as possible of foreign combinations. The rubber survey, which has been already begun, will be conducted through cooperation with experts from the Department of Agriculture, while the other surveys in connection with raw products will be conducted almost entirely by the regular staffs of the Department of Commerce.



MAJOR GEORGE F. AHERN HARVEY S. FIRESTONE PHILLIP H. LOCKHART A. C. MILLER

Prominent Speakers at the Firestone Meeting

Hoover Confers with Automobile and Rubber Representatives

In order to facilitate the preparation of plans for the rubber inquiry, Herbert Hoover, Secretary of Commerce, invited representatives of the automobile and rubber industries to confer with him at a meeting held March 8 at The Automobile Chamber of Commerce, 366 Madison avenue, New York, N. Y. These representatives were requested to name a committee to work with government representatives in investigating the possibilities of growing rubber in the Philippines and elsewhere, Mr. Hoover also out-

lining the scope of the investigation made possible by the Congressional appropriations.

Rubber Association Accepts Hoover's Invitation

The Rubber Association of America also informed Secretary Hoover of its intention to accept his invitation to assist the Department of Commerce in the proposed rubber survey. The special committee, as designated by the association, although serving unofficially, will be in a position to supply the government with much valuable data. The personnel of this advisory committee is published in this issue under Rubber Association activities.

Agreement on Scope of Rubber Investigations

As an attempt toward bringing about a reconciliation of the views of the various rubber interests involved, Mr. Hoover has also invited The Rubber Association of America, The American Automobile Association, and the group headed by Harvey S. Firestone to appoint committees to meet in Washington at some future date, when efforts to reach an agreement regarding the rubber investigation will be made. It is believed that these committees can be of much assistance to the Departments of Commerce and Agriculture in connection with the proposed rubber survey.

British Policy Threatens Industry

Horace De Lisser, president of the Rubber Association, says that a crisis threatens the rubber industry:

Winston Churchill in a recent statement published in London and this country declared that the British rubber growers were under no obligation to supply the United States with rubber below the cost of production and that it was impossible for the Colonial Office to witness the financial ruin of the rubber producing colonies owing to the continued sale of their products below the cost of production.

In the first place, the Rubber Association of America, which represents 95 per cent of the rubber manufacturers in the United States, does not seek a supply of crude rubber below the cost of production nor does the association have the slightest intention of causing or witnessing the financial ruin of plantation owners.

It is because the Rubber Association of America, the largest consumers of rubber in the world, is convinced, after a most thorough investigation, that the policy of the British Colonies in restricting the exports of crude rubber threatens the whole rubber industry here and abroad that the association is pressing the Rubber Growers' Association of London for a repeal of the restriction order or an immediate modification to permit greater flexibility in the supply of rubber.

The Stevenson plan for restricting the export of crude rubber today threatens to introduce wild speculation in rubber prices. Its ultimate effect will be to curtail rubber production on the plantations. Such a course would be ruinous to the rubber growers.

Members of the Rubber Association are looking forward to a greater consumption of rubber during the summer. To take care of our needs this year and in the future it is imperative that the planting of new rubber be encouraged. This association believes that the policy of the British colonies today will be far more injurious to the plantations than to the rubber industries of this country.

A Planter's Viewpoint

Fred T. P. Waterhouse of Honolulu, well known as a rubber planter and the Singapore agent of several Hawaiian-owned Malay Peninsula rubber plantations, is very widely quoted in Honolulu and Malayan papers. He makes these points:

The commercial organizations in Singapore and other centers of Indo-Asiatic trade were solidly opposed to government interference. The planters' desire for restriction and the advantage of an artificial boost in prices was so strong that commercial opposition became passive.

The situation was curing itself and the market would have righted itself without legislation. The reasons were that the stress of continued low prices had reduced production costs over 50 per cent, or from 28 to 33 cents, gold, to 13 to 14 cents (all costs, depreciation excepted) on Pahang, one of the Honolulu owned properties. The same was true in greater or less degree in the case of many other rubber properties.

A voluntary restriction of production had been adopted by some planters; a few estates had been forced out of existence, and the output of others had been curtailed through natural causes or for financial reasons. The interests of producer and consumer are so intimately related that arbitrary restriction of rubber exports at a time when consumption was increasing is liable to react against the plantation interests. Had prices been allowed to adjust themselves naturally it would have been better for all.

The result has been that the hundreds of small independent planters have sold their certificated output at the standard market quotation and have then turned about and sold the uncertificated balance to whoever would buy it, at whatever price offered. Others have transferred or sold their export permits and stopped tapping. Some of the larger planters have bought up enough export permits to cover their entire output and are shipping it unrestricted.

Rubber without export permits is steadily accumulating in the Malay peninsula, and what is really happening is the transfer of the "surplus" from London to Malaya and Ceylon.

The accumulation of a surplus in these countries will have the advantage of tending to prevent a sharp advance when the market is above 18*d*. On the other hand, as it cannot be released under the restriction enactment below 18*d*, it should have no depressing tendency when the market is below 18*d*. As export permits are issued only to planters the permits would be utilized by them first to export their entire potential output before any surplus in speculative hands could be put on the market. The Malayan Government, however, has warned the planters of contemplated local legislation to prevent any accumulation of such stocks. This would be detrimental to the interests of the consumers.

Opinions of Prominent Journals

The *Straits Times* presents the planter's side ably and fairly. It says in brief:

Restriction is nothing more than the adjustment of supply to demand. There is no industry in the world that does not periodically restrict production when the demand falls so low that the price becomes unremunerative. The greatest industry in America is wheat growing, and if the big crop of one season leaves a heavy carryover which is prejudicial to fair prices, the acreage sown for the ensuing season is cut down so that the tone of the market may be restored. If the agents of American tire makers report that they are becoming overstocked, the tire manufacturers curtail production until the surplus is cleared off.

Brazil restricted coffee production and nobody challenged her right to do so. Her action, like the action of Malaya and Ceylon, was under government control. Further, neither the Stevenson committee nor this journal, which has been the most strenuous advocate of restriction, has ever given the slightest countenance to attempts to raise the price of the commodity to any fancy figure. Malaya wants a fair price and no more, and we have made the American consumers masters over restriction because, when they pay the fair price for a period long enough to absorb redundant stocks, restriction will automatically cease.

If this is a policy against which Americans think they have a right to protest, we would direct their attention to the heavy tariffs on English and other foreign goods which are imposed with the express purpose of securing a higher price to American than to foreign producers. Can an English tire maker put his wares on the market without a loss in getting them over the tariff wall?

We do not think that much countenance will be given to the grumblings of consumers. They have made hundreds of millions of dollars at our expense. If we had put restriction in force, as we ought to have done, two years ago, there would not have been a word of protest. Any reasonable proposals that are made to stabilize the price round a fair profit figure will have our very cordial support. Restriction does not create the menace of shortage, because it is something over which we have absolute control.

If the Philippines, or any other part of the world which is under the American flag can grow rubber as cheaply as we grow it in Malaya, it is absolutely certain that the opportunity will not be missed.

However, if American consumers want reasonably cheap rubber in the future, the less they say about great American planting enterprises the better. Such talk does not encourage Malayan estate owners to plant up their vacant areas, yet the whole of these may be needed a few years hence.

The New York *Commercial* calls "for a liberalization of the British Export Restriction Tax." It also says that "New Mexico and Arizona are looked upon as particularly promising areas for rubber planting because of climatic conditions as well as accessibility to the Mexican labor markets." Of course reference cannot be made by any possibility to Hevea rubber. The *Commercial* criticizes the Firestone conference, saying that "the rubber manufacturers disavow any anxiety because of British control of rub-

ber production." Which is quite true, but it goes on to say that "as the Philippine Islands are to be independent some time in the future a vast rubber-growing industry there at this late date is impracticable."

The Boston *Journal of Commerce* thinks that "with the Treasury already facing a severe deficit, the expenditure of $500,000 to find out what we practically already know is unwarranted"; that "the demands of our cotton producers for a restriction in that article do not accord in that instance with out insistence for unrestricted supply of rubber."

The Los Angeles *Times* sees in the Stevenson plan a "rift in Anglo-Saxon unity."

Report of the British Rubber Growers' Delegation

America Wants an Adequate Rubber Supply at Reasonable and Stable Prices

THE report of the delegates from the Rubber Growers' Association, of London, England, on their visit to the Rubber Association of America in January and February has been published as a 16-page pamphlet.

Scope of the Report

It names the members of the British delegation and of the special American committee, both of which have appeared in THE INDIA RUBBER WORLD. It presents the itinerary of the delegates while in America, which included visits to the Department of Commerce, the most important manufacturing centers in the eastern states and to many leading men in the industry. Allusion is made to numerous new uses of rubber, now in various stages of development, which bid fair to become commercialized and enlarge the demand for crude rubber provided it is available at about 1*s.* 6*d.* per pound.

American Cooperative Spirit Acknowledged

Acknowledgment is made of the friendly hospitality accorded on every hand and the readiness with which access was given them to everything which might be helpful to them in their mission. Particular mention is made of the atmosphere of cordial frankness and desire to arrive at a clear understanding of the mutuality of the interests of producers and manufacturers, which facilitated their task in every way.

Sounds a Warning on American Optimism

The delegation found America enjoying a period of internal prosperity from which there will probably be a reaction, and throughout the tour sounded a note of warning as to the pronounced optimism with which they were confronted. The delegates reminded the special committee of the inaccuracy of the American forecast of 1922 requirements. Twelve months ago the highest available American estimate of crude rubber absorption in 1922 did not exceed 180,000 tons, whereas no less than 275,000 tons are shown by the latest statistics as having been absorbed by manufacturers representing about 95 per cent of the industry.

Results of the Conferences

The results of the numerous conferences are summarized as follows:

1. There is a general appreciation of the need for the legislative measures taken by the eastern governments.
2. There is a keen desire to see stability in the price of rubber.
3. No objection is taken to the level of price on which the exports pivot.
4. There is a definitely expressed fear that the legislation may prove insufficiently elastic to prevent an actual shortage of rubber if America's requirements come up to present anticipations; that if this were to eventuate speculation and price manipulation would inevitably ensue in a manner most detrimental to the interests of manufacturers and producers alike.
5. Some of the American manufacturers recognize that the general prosperity enjoyed at the present time by their country may be adversely affected by the disorganization prevailing in Europe, and they are generally prepared to admit that if their forecast of America's crude rubber requirements proves to be too optimistic, any reaction will fall on producers more heavily than on manufacturers. They also recognize that with crude rubber at its present price a substantially larger weight of reclaimed rubber will be used than has been the case during the past eighteen months, and that their crude rubber requirements will be proportionately reduced.
6. The Americans feel, however, that they are entitled to ask, and they do most strongly urge, that a declaration be made by or on behalf of the governments controlling the restriction of exports, to the effect that if the legislation at present should prove to be insufficiently elastic to furnish adequate supplies of rubber for the needs of the industry as and when required, steps will be taken by those governments to release additional exports more rapidly than present legislation admits. This request for a declaration has the support of Mr. Hoover, Secretary of State for the Department of Commerce at Washington.

Mutuality of Interest

It is recognized that the prosperity of the plantation rubber industry depends primarily on the rubber manufacturing industry of America, and it is strongly emphasized that rubber manufacturers have passed through a crisis involving them in losses quite as severe as those sustained by producers. The difficulties and stress of the years 1920 and 1921 have brought about a true perception of the fact that the interests of producers and manufacturers are really inseparable, and that there cannot be permanent prosperity for the one unless the other similarly participates. It is also stated that Americans recognize that they cannot get adequate supplies of rubber unless they pay a price which leaves producers an ample margin of profit, and that the ultimate prosperity of the producers depends on extending the use of rubber, which can only come about on a basis of mutual confidence. There is every reason why the closer contact established between the Rubber Growers' Association and the Rubber Association of America should be fostered in every way possible.

Plantation Costs

Regarding the question whether rubber supplies on an ever increasing scale will be available, to which American manufacturers are devoting considerable attention, realizing as they do that planted areas have increased but little during the past three years, and that it takes seven or eight years to bring new plantings to maturity, the delegates presented the following plantation cost estimate:

	£	s.	d.
Cash outlay to plant up and bring into bearing an acre of rubber	60	0	0
Add 6 per cent simple interest on an average of £35 per acre during seven years, say	15	0	0
Making the true cost per acre in bearing	75	0	0

Assuming a yield of 400 pounds of rubber per acre, it was stated that a profit of 7*d.* per pound is necessary in order to give a gross return of 15 per cent on the investment, and that it is important to realize that with rubber at 1*s.* 6*d.* per pound, the value of the crop represents a turnover of the capital outlay only once in 2½ years. There is now a general appreciation of the need for an average price of 1*s.* 6*d.* per pound, London landed terms, for standard quality rubber, and no objection is taken to the price

basis adopted under the restriction scheme. The question has, however, been raised as to whether this level of price will induce further planting, having in mind the expansion in the use of rubber which is visualized, and the delegates expressed the opinion that extensions to existing estates would more probably eventuate than the opening up of entirely new undertakings.

The report states that the suggestion that American capital should be applied to the development of rubber plantations on an extensive scale in the Philippines, and to the encouragement of rubber production in South America appears to find little support. Labor conditions in the Philippines, and the prospect of early self-government there, are against the former proposal, and conditions in Brazil are not such as to encourage any large developments there so long as plantation rubber is available in adequate supply at 1*s.* 6*d.* per pound.

Reclaimed and Crude Rubber Absorption

The numerous appendices include the following statistics of American crude rubber absorption gathered by the delegates, and estimates of crude rubber export and absorption presented by them:

Reclaimed Rubber Absorption

The absorption of reclaimed rubber in the United States, expressed as a percentage of the crude rubber absorbed, has been approximately as follows, based on the Rubber Association questionnaire:

Year 1919	36 per cent
Year 1920	40 per cent
Year 1921	25 per cent
Year 1922	19 per cent

During 1921 and 1922 crude rubber was substituted for reclaimed in many lines of manufacture, but reclaimed is already being used in increasing quantities again, and it would appear from the information received that when crude rubber is over 20 cents per pound, say 10½*d.*, reclaimed will hold its own for the purposes for which it is suitable.

1923 Output and Absorption of Crude Rubber

The delegates furnished the following estimate:

	Tons
1923 output of plantation rubber from unrestricted areas (80,000 tons), wild rubber (20,000 tons)	100,000
Approximate standard production of the plantation areas on which there is either compulsory or voluntary restriction of exports—350,000 tons. Sixty per cent of this is 210,000 tons	210,000
Making output (export) of crude rubber in 1923 at least	310,000

Note—Since these figures were submitted the official figures of standard production in British Malaya have been published (270,000 tons) from which it is clear that the foregoing figure of 350,000 tons is a conservative one.

No change can be made in the percentage exportable at the minimum rate of duty until May 1, 1923, but provided the average price of standard quality smoked sheet is maintained at not less than 1*s.* 6*d.* per pound, London landed terms, during the three months of February, March, April, 1923, and during the remaining quarters of the year, the following rubber would be available for absorption in addition to existing surplus stocks:

	Tons
January-April, 1923	103,000
May-July, 1923	86,000
August-October, 1923	95,000
November-December, 1923	69,000
Total	353,000

On this basis output (export) at the end of 1923 would be running at the rate of 420,000 tons per annum, 90 per cent of standard being then exportable at the minimum rate of duty.

A Veteran Rubber Manufacturer

On January 10, 1923, Charles B. Street, general superintendent and a director of Gutta Percha & Rubber, Ltd., Toronto, Canada, celebrated his eightieth birthday, still engaged in his life work, with keen mental vision and physical faculties but slightly impaired. Nearly all of the great developments in the rubber industry have occurred during his lifetime, and it is always a matter of keen enjoyment to his many friends to listen to, and profit by, the experiences of his fifty-three years of devotion to the industry.

Charles B. Street

He was born in Brooklyn, New York, in 1843. His career in the rubber business began in 1870 as an employe of an importer of rubber clothing, which at that time was almost entirely obtained from Great Britain. The curing was done by the acid process, which in the early days produced very uncertain results. At times the clothing arrived in New York quite hard, at other times soft and tacky. Usually only a portion of each shipment was in good, salable condition. One of Mr. Street's duties was to receive and examine the goods upon arrival. He had to select the goods from the "not-so-good" and from those obviously bad.

After being so employed for about a year, Mr. Street accepted a position with the Blake Hose Co. of Boston, Massachusetts, to manufacture a patented fire hose made from a flat strip of duck coated with rubber on one side and folded into circular form, the seams or laps being sewn together. The hose so made leaked badly at the lap. Mr. Street devised a process for laying a strip of rubber over the lap for the purpose of making the hose water-tight. A patent was obtained and assigned by him to the company for one dollar and other valuable considerations, one of which was to take charge of the factory as its superintendent.

At that time the coating of the duck with rubber was done by the India Rubber Glove Manufacturing Co. at its factories in Naugatuck, Connecticut. Mr. Street went to Naugatuck to study the various processes of rubber manufacturing as then known, and remained there about one year. He then returned to Boston and started the rubber manufacturing plant of the Blake Hose Co., which later was reorganized and became what is now the well-known Boston Woven Hose & Rubber Co.

About that time the Eureka Fire Hose Mfg. Co. started to make circular woven cotton hose such as is still manufactured by them. This was so far superior to that made with the sewn lap as to displace it, and its manufacture was discontinued.

In 1877 Mr. Street went to New York, N. Y., as superintendent of the Combination Rubber Co., then located at Twenty-fourth street. The company later moved its plant to Bloomfield, New Jersey. This position he held until 1882, when he returned to Boston and started a factory for the Hall Rubber Co., to manufacture gossamer clothing, and afterward installed machinery therein for making a full line of heavy, rubber-surfaced clothing. While there he made the first double-texture waterproof garments produced in America.

On April 1, 1888, Mr. Street went to Toronto, Canada, as superintendent of the factory of The Gutta Percha & Rubber Manufacturing Co. of Toronto, Limited, which was the name of the company before its reorganization some years later. At that time the company manufactured mechanical rubber goods only. Here he has ever since remained, still rendering valuable service, which has been almost literally unbroken either by illness or for recreation. Holidays apparently have no charm for him. At all events, during his long business career in Toronto it has been impossible to induce him to take a vacation.

The Colloid Mill[1]

Mechanical Principle—Construction Features—Particle Sizes After Milling

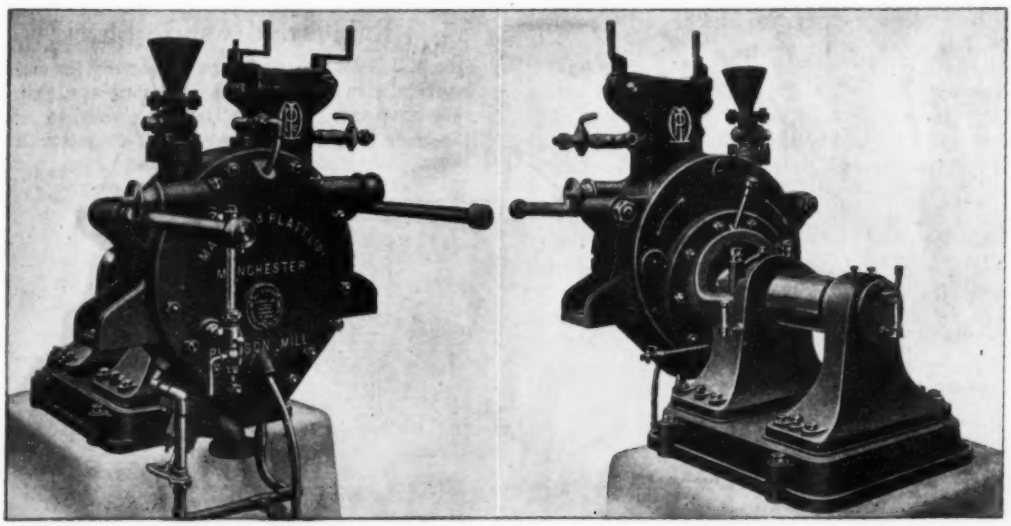
IN the course of experiments on grinding carried out in a methodical and scientific manner for a number of years, Plauson, the inventor of the colloid mill, hit upon the idea of grinding in a quantity of liquid in a machine constructed on the principle of beater mills, operating at high speed. With a peripheral speed of the beaters of only 10 meters a second, there is scarcely a difference in fineness to be noticed in grinding by the colloidal mill against grinding in air. At 20 meters a second, particles down to 0.003 mm. are obtained, and by increasing the velocity to 40 meters a second actual colloidal dispersions are produced. The nature of the dispersion medium is of considerable importance in the process of dispersion. Many materials can be dispersed in water, others in a much shorter time and to a finer degree in some organic medium.

Another important fact, demonstrated experimentally, is that a series of bodies, if added only in very small quantities to the mixture of material and dispersion medium, are able to hasten the dispersion in a surprising manner. The effect of such dispersion accelerators is as a rule due to the fact that either they are able to penetrate more easily than the dispersion medium into the material to be ground and so bring about a more rapid disruption, or they allow more easy penetration to the dispersion medium.

Revolving Beaters

In the lower portion of the mill cavity is arranged a rotating shaft carrying a number of beaters or hammers arranged at eight points around the circumference. These beaters are formed of blades of high quality steel and are securely keyed on the shaft, with distance pieces between them of rather greater thickness than the blades of the beaters themselves. Above and below the axis of the revolving shaft carrying the beaters there are fixed in the body of the mill casing corresponding sets of fixed blades or anvils at suitable distances apart, in order that the revolving blades may pass with suitable clearance between the set of fixed blades.

The beater shaft is of forged steel of special high quality, carefully heat-treated to remove internal stresses and to refine the crystal structure, after which it is oil hardened and tempered to develop maximum toughness and resistance to fatigue. It is specially designed for great rigidity and the uniform and gradual distribution of stresses. The rotating parts are very carefully balanced to insure smooth running at the high angular speeds for which the mill is designed.



FRONT BACK

The Plauson Colloid Mill

Design and Mechanical Features

The standard type of colloid mill is herewith shown in front and back views. It consists of a circular body of robust design, made of special cast iron, non-porous and particularly resistant to corrosion. The body is double cased in the casting, the cavity being arranged for cooling or heating by means of water or steam as required. A filling branch is provided with removable baffle tube, funnel and inlet valve. There is also a charge hole for solids, with a hinged lid. At the bottom of the mill is an outlet branch fitted with a plug outlet valve.

Bearings

Ball bearings carrying the shafts are mounted in massive and very rigid cast iron housings outside the mill, and between these bearings there is provided a belt pulley for driving from an electric motor or other source of power.

Centrifugal throwing disks and suitable stuffing boxes and glands provide against leakage along the shaft of the material being ground.

Baffle Plates

Perforated baffle plates are arranged co-axially with the beater shaft, with openings for the material being treated. The introduction of these plates reduces power consumption to a minimum by cutting out useless friction on the material.

[1]Data and illustrations supplied by Plauson's Mill & Filter Press, Ltd., London, England.

PARTICLE SIZES BEFORE AND AFTER COLLOIDAL MILLING

Size of particles	Red oxide		Lithopone		Zinc oxide		Carbon black		Sulphur		China clay	
	Before Per cent	After Per cent	Before Per cent	After Per cent	Before Per cent	After Per cent	Before Per cent	After Per cent	Before Per cent	After Per cent	Before Per cent	After Per cent
Above 1,000 μ	0.5	0	0.4	0	0	0	0	0	4.8	0	0	0
1000-400	3.3	0	3.0	0	0	0	6.7	0	27.3	0	0	0
400-45	56.7	0	17.0	0.2	1.75	0	17.2	0	58.7	0	0	0
45-4.8	34.6	10.9	68.0	1.4	56.5	1.9	43.2	0	8.6	3.1	30.0	0
4.8-1.0	3.4	13.0	11.3	11.8	41.7	98.0	20.2	3.1	0.5	18.2	54.2	11.3
1.0-0.01	1.5	76.1	0	86.5	0	0	12.7	96.0	0	78.6	15.7	88.7

COMPARISON OF DIMENSIONS

1 mm., millimeter ..... = ... = 0.03937 inch = about $\frac{1}{25}$ inch

1 μ, micron ..... = 0.001 mm. = 0.00003937 inch = about $\frac{1}{25,000}$ inch

Diameter of colloids .....

0.1 μ = 0.0001 mm. = 0.000003937 inch = about $\frac{1}{250,000}$ inch

0.01 μ = 0.00001 mm. = 0.0000003937 inch = about $\frac{1}{2,500,000}$ inch

End Cover

The front cover of the mill is of the same material as the body and is specially designed, so that it may be removed in a very short time with the minimum of labor for the examination of the interior of the mill and to allow its thorough cleaning when necessary before changing from one material to another. The weight of the end cover is carried on runners supported by projecting steel spindles secured in the body of the mill so that the cover may be drawn back easily and replaced without having to be lifted.

The removable cover, like the body and fixed end cover, is also double cased for heating and cooling as required. It is also fitted with gage glass, cocks, and connections. The entire machine is carried on a rigid cast iron base plate arranged for holding down bolts.

Application

The potential commercial applications of the colloid mill are exceedingly numerous.

As applied to rubber compounding ingredients, the change in particle size, shown in the above table, is remarkable and demonstrates the effectiveness of the colloid mill treatment as compared with results obtainable by other mechanical methods.

POPULAR TIRE SIZES FOR AMERICAN CARS AND TRUCKS

A wide divergence is noted in the sizes of the tires forming part of the equipment of the automobiles and trucks featured in the "Handbook" recently issued by The National Automobile Chamber of Commerce, New York, N. Y.

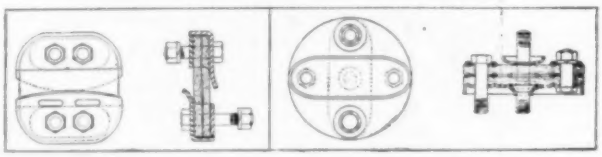
The pneumatic sizes evidently preferred for the 155 passenger automobiles are the 32 by 4 inch type, used for 47 cars, and 32 by 4½, used for 30 cars. Twenty-two automobiles are equipped with tires measuring 31 by 4 inches, while twenty others prefer the 33 by 5 inch type. Even the six electric vehicles differ in tire sizes, only two having the same measurement, 32 by 4½ inches.

Variation is particularly noticeable in the tire equipment of the 69 commercial cars and trucks featured in the "Handbook." Here only eight vehicles, using solids only, have the same tire measurement, 36 by 6 inches for the front wheels and 40 by 6 inches for the rear. Five trucks, equipped with pneumatic cords only, have tires measuring 34 by 5 inches for both front and rear wheels, while five others, using solids only, show 36 by 4 inches for the front wheels and 36 by 7 for the rear. Four others, also equipped with solids only, measure 36 by 5 inches for the front wheels and 36 by 10 for the rear. Except for these mentioned there is the greatest possible variation in truck tire sizes, from one of only 31 by 4 inches to another measuring 40 by 14.

It is interesting to note that twenty trucks are equipped solely with pneumatics or pneumatic cords, while four others offer a choice of solids or pneumatics. Of the four interurban passenger buses included in this division two are equipped with pneumatic cords only while the two others use a combination of cushion tires and pneumatics.

Rubberized Fabric Shackles

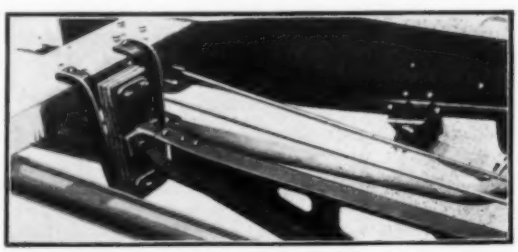
Designs for 1923 passenger cars, particularly the more expensive makes, require rubber and rubberized fabric as a part of the mechanical equipment. The new Handley chassis, for example, has as one of its unique features a type of spring shackles that need no lubrication. Made of flexible rubberized fabric, similar to that



Belflex Rubberized Tension Shackle **Belflex Rubberized Pivot Shackle**

used in fabric universal joints, these "tension" and "pivot" shackles, applied at the front and rear ends of the springs, supply greater flexibility, reduce twisting action, take the thrust and pull on the springs, and give them increased life.

The new Peerless automobile includes a somewhat similar mechanical feature in the design of its torque arm, where rubberized material is also specified. By means of the construction of this arm, which reaches from the front of the rear axle to a cross member of the frame, torsional strain is said to be absorbed, while the



Peerless Rubberized Torque-Arm Shackle

rubber fabric connection at the front end eliminates squeaks and rattles without the necessity for lubrication. A flexible fabric joint is also being used for the new Mercer car, this being introduced between the brake mounting and the unit power plant, in order to relieve the brake mounting bearings from any strain.

Testing Electricians' Rubber Gloves

High Voltage Tests—Special Container Tank—Electrical Control

By R. W. Chadbourn[1]

IT is very generally recognized that rubber gloves for electrical workers receive about as severe use as any rubber product. Owing to the hazard involved, the importance of periodic inspection and testing is at once apparent. For many years The Edison Electric Illuminating Company of Boston has followed the practice of making high potential tests, every three or four months, on all rubber gloves used by its employes in connection with work on high voltage lines or apparatus.

The high voltage tests are made by subjecting each glove, to within about two inches of the edge of the cuff, to an alternating pressure of 10,000 volts for one minute, the pressure being gradually raised from zero. A measurement is made of the current flowing through the gloves at 10,000 volts; this should not exceed 10 milliamperes. Water is commonly used for the test electrodes, since it is easy to use and makes more intimate and continuous contact with the surface of the glove than any solid substance which might be used.

In the original form of apparatus used by the Edison company, a single glove was nearly filled with water and then suspended in a tank of water by four clothespins, each one of which was hung by a piece of string from a small insulating post on the edge of the tank. This device was effective, but the method of handling the gloves was somewhat crude, at least five minutes being required for testing each glove.

In a later form of apparatus, the clothespin suspension was eliminated, and the glove held in a special sheet metal holder made to fit the body of the glove, a hole being cut part way down the side to receive the thumb. The holder was set in a tank of water so that its upper edge came about to the surface of the water, the

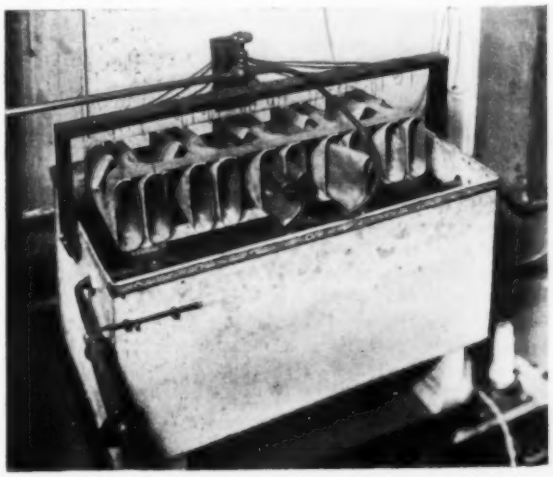


Fig. 1. Rubber Glove Testing Apparatus

cuff of the glove extending about two inches higher. This outfit facilitated filling the gloves for test, but the average time per test was not greatly reduced.

With the great increase in the number of gloves tested in recent months, it became imperative to develop, if possible, a device which would materially lessen the labor and time of testing. Accordingly a much-improved form of apparatus, which permitted the testing of ten gloves simultaneously, was devised.

In this apparatus, the previous type of metal holder, shaped to fit the body of the glove, was retained but, instead of a single one, ten of these were rigidly tied together with strips of metal, and

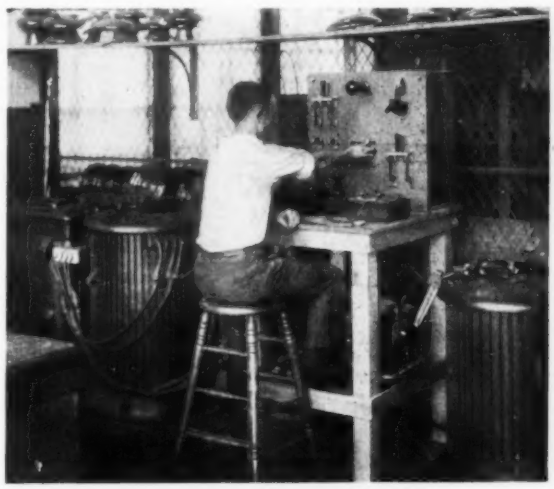


Fig. 2. Switchboard Control

the combination mounted on a rod running along the top edge at one side. (See Fig. 1.) This rod is supported by the ends of the containing tank, one end connecting to an external lever, by which the glove holder can be swung from a vertical position in the water to a horizontal position above the surface.

In preparing for a test, the glove holders are swung to the horizontal position above the water and as many gloves as desired, up to ten, inserted in the holders. The latter are then swung back into the water, with the vertical test position, the gloves being then immersed to within about two inches of the edge of the cuff. The gloves are quickly filled with water to the same level by means of a rubber hose connected through a suitable valve to the water supply system. Above each glove, on a wooden bar, is mounted a binding post, to which a small chain is attached. Each chain can be dropped readily into the glove below it and forms one electrode for the test. From the various binding posts wires run to a set of specially constructed push switches on the switchboard. (See Fig. 2.) With the switches in their normal position, the leakage currents of the various gloves under test flow through the switches to a common terminal, which is grounded. Pushing one of the switches shunts the current from the corresponding glove, without opening the circuit, through a milliammeter located in front of the operator, so that the leakage current of that particular glove may be readily noted. The instrument has a small sphere gap connected across it, with the gap as small as it can be made, so that if failure of a glove occurs while the instrument is in use, the gap will spill over and protect it from injury.

110 volts A. C. is fed through a main switch and small circuit breaker, shown on the switchboard, to a step-up transformer, voltage being varied by an induction regulator on the primary

[1]Edison Electric Illuminating Co., Boston, Massachusetts.

side of the transformer. Voltage is measured by means of a potential transformer connected across the secondary or high voltage side of the test transformer. One side of the test transformer is

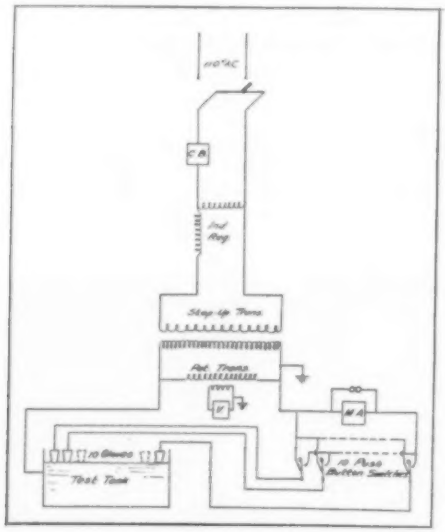


Fig. 3. Diagram of Electrical Circuits

grounded, the other side connected to the tank containing the glove holders. The arrangement of circuits is shown in Fig. 3.

To test, after the gloves have been placed in position and the chain electrodes lowered into them, voltage is raised gradually from 0 to 10,000, held there for one minute, then gradually decreased again to 0. During the minute the 10,000 volts are applied, the tester notes the individual leakage currents on the milliammeter by operating the push buttons one at a time. Ten observations of current can easily be made within the minute. In case of failure of a glove, the circuit breaker opens the primary circuit. The faulty glove is then removed and the test resumed. After a set of gloves has been tested, the holder is tilted to the horizontal position. This automatically empties the gloves; they are then quickly withdrawn and placed on a suitable rack to dry.

Since the installation of this apparatus, the time of testing has been reduced fully 60 per cent. As tests are made on from 500 to 600 gloves a month, this represents a saving of over three days' labor for one testman a month. Under extremely favorable conditions, that is, with no failures, 100 gloves have been tested in 45 minutes.

RUBBER STAMPS FOR PRINTING BAGS

Rubber stamps are employed for printing on burlap bags. They are made in either of two ways. In case the design requires fine lines of two or more colors a wood cut of the outline of the design is cut. Next cuts are made for the different colors, care being taken that each block is cut to register properly with the others in printing. From the wood-cut blocks electros are made and form the rubber stamps in the usual manner. The stamps are then mounted on blocks by gluing and tacking in place.

Stamps of large open designs and of letters of any size above one-half inch are made from three-ply packing. The design is drawn on the packing and cut two-ply deep with a knife. The stock between the printing surfaces is removed down to the third ply by means of convenient pliers and the finished stamp mounted, as in the first instance, with glue and tacks on a suitable block ready for use in a printing press. A rubber stamp is better than wood or metal for printing on coarse cloth or jute because it is yielding.—*Stamp Trade News.*

Judicial Decisions

In re West Coast Rubber Corporation, Inc., District Court, N. D., California, First Division, July 8, 1922. No. 12338.

In a petition to review the order of the referee directing payment of labor and attachment claims in the case of the West Coast Rubber Corporation, Inc., bankrupt, the ruling of the referee is affirmed. A former decision in a similar case "directs that taxes be paid in advance of dividends to creditors; and 'dividends,' as commonly used throughout the act, means partial payment to general creditors."—*Federal Reporter,* Vol. 283—No. 1. Page 351.

Treasury Decisions

ANTIDUMPING ACT, 1921—Finding by the Secretary of the Treasury.

The Secretary of the Treasury makes finding under Section 201 (a), antidumping act, 1921, of dumping in the case of rubber balls imported from Germany.

TREASURY DEPARTMENT, January 20, 1923.

To Collectors of Customs and Others Concerned:

Section 201 (a) of the antidumping act, 1921, provides as follows:

SEC. 201 (a). That whenever the Secretary of the Treasury (hereinafter in this act called the "Secretary"), after such investigation as he deems necessary, finds that an industry in the United States is being or is likely to be injured or is prevented from being established, by reason of the importation into the United States of a class or kind of foreign merchandise, and that merchandise of such class or kind is being sold or is likely to be sold in the United States or elsewhere at less than its fair value, then he shall make such finding public to the extent he deems necessary, together with a description of the class or kind of merchandise to which it applies in such detail as may be necessary for the guidance of the appraising officers.

After due investigation, I find that the industry of manufacturing rubber balls in the United States is being or is likely to be injured by reason of the importation into the United States of rubber balls from Germany, and that such merchandise is sold or is likely to be sold in the United States at less than its fair value. —EDWARD CLIFFORD, Assistant Secretary.—*Treasury Decisions,* Vol. 43, No. 5, Page 4.

No. 45661.—Protest 958106 of F. L. Slazenger (New York.)

RUBBER SOLE AND HEEL ATTACHMENTS. Sole and heel attachments composed of cotton and india rubber with nails or pegs of special design for fastening to shoes, classified as cotton and india rubber wearing apparel at 30 per cent ad valorem under paragraph 356, tariff act of 1913, are claimed dutiable as manufactures in chief value of rubber at 10 per cent under paragraph 368.

Opinion by Weller, G. A. On the authority of G. A. 8445 (T. D. 38763) and Abstract 44145 the sole and heel attachments in question were held dutiable as manufactures in chief value of rubber under paragraph 368.—*Treasury Decisions,* Vol. 43, No. 7, page 23.

PAPER INDUSTRIES EXPOSITION IN NEW YORK

An instructive and varied program has been prepared for the Paper Industries Exposition which will be held at the Grand Central Palace, New York, N. Y., during the week beginning April 9. Among the many interesting exhibits will be one arranged by C. K. Williams, Easton, Pennsylvania, displaying dry pigments and paints used both by the paper and rubber industries, while the Voorhees Rubber Manufacturing Co., Jersey City, New Jersey, will have charge of an exhibit of high speed belts, water hose, steam and air hose, and Rub-Steel valves.

What the Rubber Chemists Are Doing

Effect of Pigments on Temperature of Tire Treads[1]

MODERN road conditions are conductive to the heating of tires so that the thermal properties particularly of reinforcing compounding ingredients become a matter of vital interest to the tire chemist and engineer.

In order to compare temperatures developed in treads compounded with carbon black, zinc oxide, clay and glue, stocks were prepared, in each case containing 20 volumes of reinforcing material to 100 of rubber, and using the same proportion of sulphur. Varying amounts of accelerator were used to obtain approximately equivalent cures for these compounds, since the effect of the pigments on the speed of the vulcanizing reaction is not the same. The alkaloid residue quinoidine was chosen because with this accelerator it is not essential to use zinc oxide, and it was desired to avoid contamination of the black, clay and glue stocks with that substance. All the preliminary work of balancing vulcanization was checked by the determination of the sulphur coefficient.

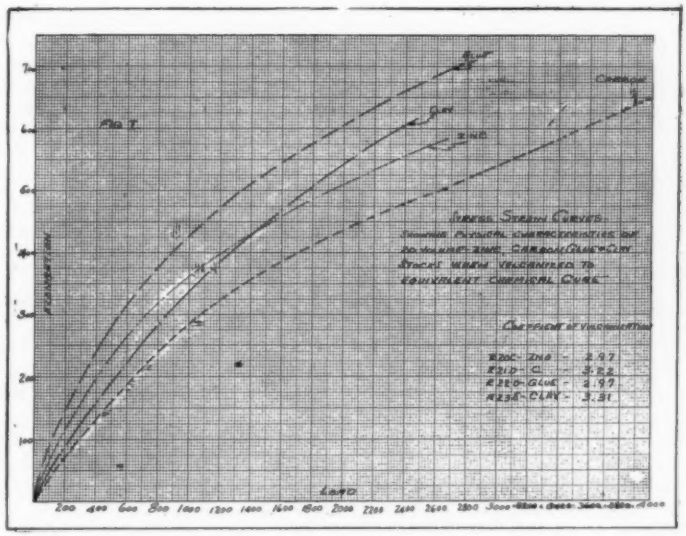


Fig. 1. Normal Stress Strain Curves at Equivalent Chemical Cure

Compounds Tested

The mixtures as weighed and the coefficients of vulcanization as cured in a tire are as follows:

Zinc Oxide R-20-C		Carbon Black R-21-D	
46	Smoked Sheet	46	Smoked Sheet
56	Zinc Oxide	18	Carbon Black
3	Sulphur	3	Sulphur
½	Quinoidine	⅜	Quinoidine
105½		67⅜	

Glue R-22-D		Clay R-23-E	
46	Smoked Sheet	46	Smoked Sheet
13	Glue	25	Clay
3	Sulphur	3	Sulphur
⅜	Quinoidine	¾	Quinoidine
62¾		74¾	

VOLUMES

100 Rubber	100 Rubber	100 Rubber	100 Rubber
20 Zinc Oxide	20 Carbon	20 Glue	20 Clay

COEFFICIENT OF VULCANIZATION

2.97	3.22	2.97	3.31

This work was done several years ago before the importance of determining the amount of sulphur combined with zinc oxide was appreciated. The zinc oxide stock is the least cured, the glue stock stands next in order, and probably the clay stock is cured the most.

The stress-strain curves of the four—all cured 50 minutes at 50 pounds—are indicated in Fig. 1 and of course show entirely different characteristics. The theoretical conductivity of the mixtures are:

Zinc Oxide R-20-C	Carbon R-21-D	Glue R-22-D	Clay R-23-E
.000552	.000379	Undetermined	.000363

A so-called multiple tread tire was built covered by quarter sections with each of the four mixtures above mentioned, in order to preserve exactly similar road running conditions, which would have been obviously impossible if the various pigments were separately used in different tires. That the temperature differentials obtained in this manner are as great as they were found to be appears sufficient justification of the method employed.

Measurement of Temperatures

The temperatures developed were measured by means of thermo-couples after the method outlined by Ashman in a recent research bulletin of the New Jersey Zinc Company.

At temperatures around 80 degrees F a cord tire properly inflated on a touring car will heat to between 120 and 130 degrees F, during an ordinary run of ten to twenty miles. Under-inflated, the tire may heat as high as 150 degrees F provided under-inflation is serious. Overloading naturally also contributes materially to the temperature increase. Under summer touring conditions (air 80 degrees) we have obtained temperatures as high as 160 to 170 degrees, after driving at maintained speed of thirty-five miles per hour, in the tread of a 5-inch cord tire well inflated and run on a Cadillac car. In the case of truck tires after a long run, as on heavy

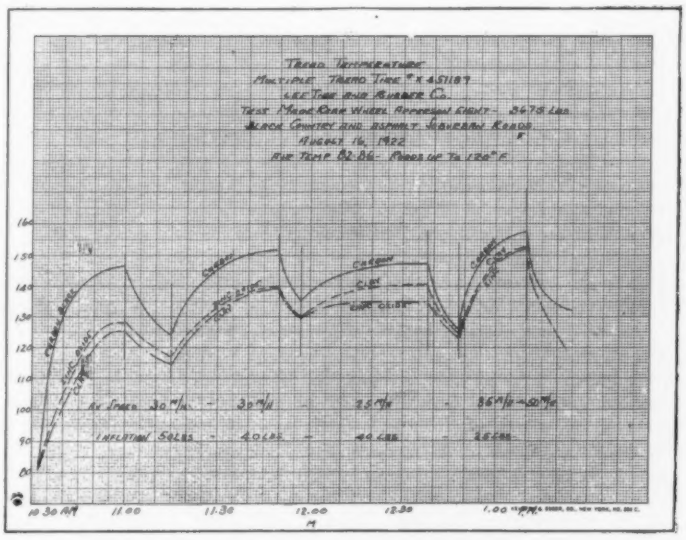


Fig. 2. Tread Temperatures of Tire Tested on Apperson Car

[1]By Donald F. Cranor. Research Department, Lee Tire & Rubber Co., Conshohocken, Pennsylvania. Paper presented at the Pittsburgh meeting of the American Chemical Society, September, 1922. Published by courtesy of Industrial and Engineering Chemistry.

passenger buses, we have records of 174 degrees F and 189 degrees F, air temperature being only 68 degrees, although both casings were run slightly under the proper inflation.

Factors Controlling Tire Temperature

Under various conditions the temperature varies widely, and under our observations we have noted as the most important factors: (1) Inflation; (2) load; (3) speed; (4) temperature of air; (5) temperature, dryness and color of road; (6) length of run; (7) construction of tire; (8) composition of rubber mixings used in manufacture of tire.

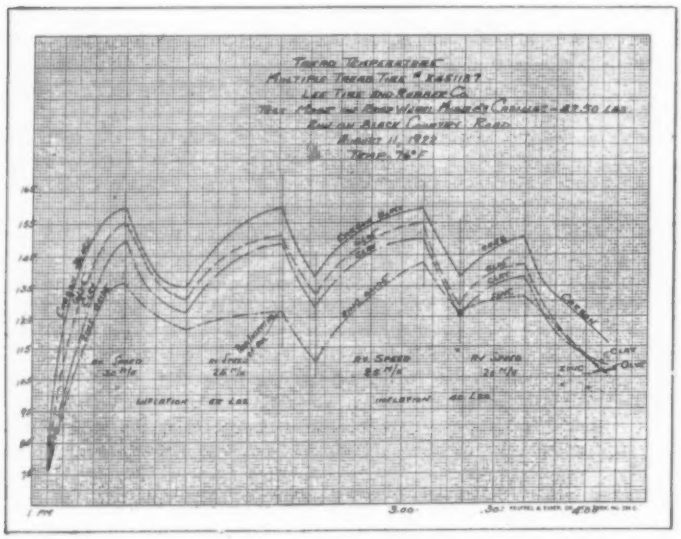


Fig. 3. Tread Temperatures of Tire Tested on Cadillac Car

The stocks in question were used to cover a 34 by 4½-inch cord tire of standard construction, that being the tire to fit a four-passenger car. The temperature difference in actual road work having been found, the tests were finished on a test wheel of conventional type, allowing long runs to be made conveniently and enormous temperatures.

It was soon learned that in general the carbon stock became 15 to 20 degrees F warmer than the zinc oxide stock, and that the clay stock ran close to the zinc oxide, usually just a little higher, but in the case of some tests as much as five degrees lower than the zinc. The glue stock invariably came between the temperature of the carbon and zinc oxide, often running well up in temperature and at other times only two to five degrees higher than the zinc, while in one notable case it was even a few degrees cooler. Probably zinc oxide shows at its best under moderate temperature conditions, and especially when the roads are cool.

The superior thermal conductivity of zinc oxide seems to carry the heat off. The average tire meets moderate or cool conditions during a great part of its service, and a run exceeding twenty-five or thirty miles without stopping is the exception rather than the rule. On the other hand, tires must be made to withstand adverse conditions, such as long tours when the atmospheric temperature runs 80 to 100 degrees and when the roads may be 120 degrees F or higher, under-inflation and over-loading, together with maintained average speed of thirty to thirty-five miles per hour. Here zinc oxide shows considerably better than carbon but the temperature difference between the two is reduced. For example, at the end of a 55-mile run made at an average sustained speed just under 30 miles per hour, and traveling 45 to 50 miles per hour for ten minutes before reading, the tire being seriously under-inflated (25 pounds), the temperature of the zinc section was 152 degrees and that of the carbon 158 degrees, air temperature being 86 degrees and the roads from 115 to 120 degrees F.

At the end of a run of approximately equal length, air 76 degrees and the day partly cloudy (tire this time being on the Cadillac) and last few miles run at rate of 20 miles per hour the temperatures on stopping were: carbon 151, glue 142, clay 138, and zinc oxide 131, or 20 degrees F lower than the carbon. There is no doubt that the thermal properties of zinc oxide give it a unique position among pigments. Curves showing the heating and cooling of all four tread sections under the conditions of these two runs are indicated in Figs. 2 and 3.

The above recorded readings are probably the most significant results obtained. They are typical and representative of many other road temperature tests which were made.

Tire Testing Machines

When using a tire testing machine various important factors, such as air temperature, speed, and load, can be more carefully adjusted and kept uniform throughout the period of test. Fig. 4 records the most satisfactory of four runs made in this manner. In general, the curves have the same characteristics as those shown indicating the results obtained on the road. On test wheel runs it was noticeable that the zinc stock heated more than the clay, which was not generally the case on the road. In another case of a two hours' non-stop test wheel run, the zinc oxide compound heated more, as shown by the following figures taken immediately after stopping:

R-20-C Zinc Oxide	166 degrees F
R-21-D Carbon	181 degrees F
R-22-D Glue	172 degrees F
R-23-E Clay	161 degrees F

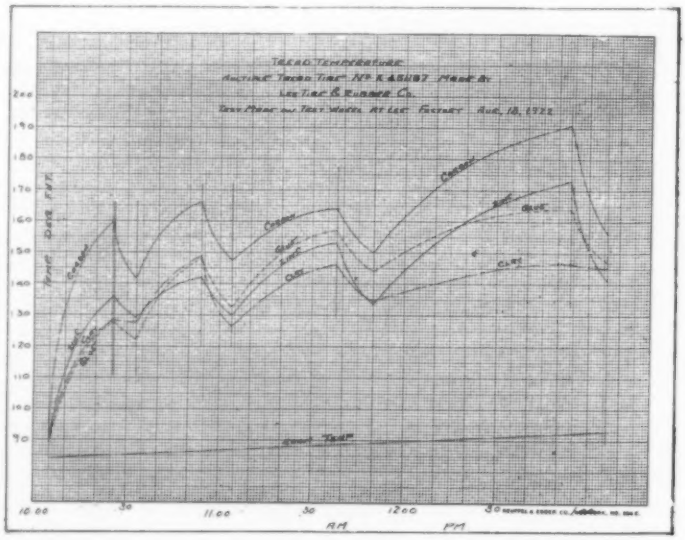


Fig. 4. Tread Temperatures of Tire Tested on Laboratory Test Wheel

although here the zinc ran only five degrees higher whereas in the case of run pictured in Fig. 3 it was 27 degrees higher than the clay and only 18 degrees lower than the carbon.

Conclusions

It would be unwise to make the conclusions from this work too definite. The air in the tube has an equalizing effect on the four

segments and there is also a certain amount of conductivity between the stocks tending to equalize the temperature of the whole tire. This may partly account for the fact that the zinc oxide stock became warmer toward the end of some of the test runs than it was during the first hour of running. By the method of inserting a thermo-couple into the tire with an awl, it was practically impossible to place it in the same position every time, and we of course know that certain parts of the tire are considerably warmer than others. Ellenwood in an article on "The Temperature of Pneumatic Tires"[2] states that probably the best method for determining tire temperature is by the pressure gage. We have made so many tests, however, that to a certain extent at least we have been able to apply the law of averages, and although the temperature readings given are probably not accurate to within several degrees plus or minus, the fact that the various stocks have time after time stood in about the same relative position, gives good indication of the relative heating of the stocks. It is believed, therefore, that the following conclusions are justified.

A carbon black stock will invariably heat up considerably more than a compound made with any of the other tread pigments.

A zinc oxide tread under ordinary conditions of tire service will run considerably cooler than one containing carbon black, the difference in temperature amounting to from 15 degrees F to 25 degrees F, in extreme cases. Under very severe conditions—as when a tire is run on very hot roads, especially at high speed and under-inflated—the difference between the heating of the zinc and carbon stocks is less, probably because there is less opportunity for the greater conductivity of zinc oxide to assert itself. Clay stocks will not in general become a great deal warmer, if any, than a stock containing an equivalent volume of zinc oxide. It is supposed that this may be due to the fact that the clay particle averages larger than that of zinc oxide, and that the clay tread may therefore not heat up quite as fast as zinc, thus offsetting the superior conductivity which zinc oxide is generally acknowledged to have.

Glue shows a heating intermediate between carbon and the other two pigments under consideration. In view of the fact that Somerville assigns such a low conductivity to glue, this may be somewhat surprising. Obviously there are other factors which enter into the heating up of a rubber compound, but there are not enough data at hand to warrant theorizing in regard to the cause of this apparent discrepancy.

[2] *Journal Society of Automotive Engineers*, August, 1922.

Chemical Patents

The United States

TIRE SEALING FLUID. A sealing fluid for pneumatic tires, gas tubings, etc., comprising a mixture of sugar, rice, a rubber solution and waste sulphite cellulose liquid.—Heinrich H. Warmund, Berlin-Charlottenburg, Germany. United States patent No. 1,444,288.

PROCESS FOR TREATING RUBBER AND PRODUCTS. Rubber is combined with a vulcanizing agent and a formaldehyde condensation product of an aliphatic amine, and vulcanized.—Charles E. Bradley, Montclair, and Sidney M. Cadwell, Leonia, New Jersey, assignors to The Naugatuck Chemical Co., Naugatuck, Connecticut. United States patent No. 1,444,865.

MANUFACTURE OF DIPPED GOODS. A rubber solution for dipping is made by adding to a suitable liquid rubber cement butyl aldehyde in proportion of from three to ten per cent.—Marion M. Harrison, assignor to The Miller Rubber Co., both of Akron, Ohio. United States patent No. 1,445,080.

VULCANIZING RUBBER AND RUBBER PRODUCTS. This comprises combining with rubber or similar vulcanizing material, a vulcanizing agent and a material comprising thiuram disulphide containing substituted alkyl and aryl groups, and vulcanizing the rubber.—Sidney M. Cadwell, Leonia, New Jersey, assignor to The Naugatuck Chemical Co., Naugatuck, Connecticut. United States patent No. 1,445,621.

MANUFACTURE OF LITHOPONE.—Frank G. Breyer, Palmerton, and Clayton W. Farber, Bowmanstown, Pennsylvania, assignors to The New Jersey Zinc Co., New York, N. Y. United States patent No. 1,446,637.

The Dominion of Canada

PUNCTURE PROOFING COMPOSITION. A tire compound comprising the following mixed into a solution of water and alcohol: asbestos, shorts, creolin, tannin, salicylic acid, ammonia, cork, methylene blue, formaldehyde, sodium acetate, and carbolic acid.—Edward Jackson, New York, N. Y. Canadian patent No. 227,967.

MAKING DIPHENYLGUANIDINE. The process comprises desulphurizing thiocarbanilide by the use of a metallic oxide in an alcoholic solution of an ammonium salt.—The Dovan Chemical Corp., Newark, New Jersey, assignee of Morris L. Weiss, New York, N. Y. Canadian patent No. 228,725.

The United Kingdom

SPRAYING LATEX. Rubber latex, or a solution of rubber is subjected to the action of gases such as air, ozone, sulphur dioxide, hydrogen sulphide, and sulphur chloride, by being sprayed into the interior and toward the apex of a converging cone of the gas.—C. Reid, 11 Glebe Road, Kilmarnock. British patent No. 190,510.

VULCANIZING INDIA RUBBER. A vulcanizing mixture of suitable proportions is given as follows: 100 rubber, 10 zinc oxide, 3 sulphur, and one-tenth part dimethyl-diphenyl-thiuramdisulphide. The latter substance is prepared by dissolving 480 parts of monomethyl-aniline, 170 parts of carbon disulphide, and 285 parts iodine in alcohol and allowing to stand until crystals are formed. The crystals are separated, washed with alcohol, and air dried.—S. M. Cadwell, 200 Ames avenue, Leonia, New Jersey. British patent No. 191,085. Not yet accepted.

RUBBER PAVING AND ROOFING COMPOSITIONS. Mineral or fibrous materials, such as sand, clay, cement, asphalt, granite, slag, leather, wood, sawdust, or metal filings are mixed with rubber latex or plastic coagulum, to which sulphur zinc oxide dyes and petroleum residues may be added. The mixture is molded under pressure into blocks, slabs, etc., which may be partly vulcanized. At this stage a facing layer of latex, coagulum, or rubber mixture is applied to the upper surface and the whole is vulcanized together.—L. Cresson, Low Hill, Tanjong, Pagar, Singapore. British patent No. 191,474.

Germany

Patents Issued, with Dates of Issue

369,592 (May 4, 1920). Method for making rubber masses containing clay. Dr. Philip Schidrowitz, William Feldenheimer and Walter William Plowman, London; represented by: R. Heering, Berlin S. W. 61.

371,710 (November 1, 1918) Method for making vulcanizable materials similar to rubber. Plauson's Forschungsinstitut G. m. b. H., Hamburg.

Austria

Patents Issued, with Dates of Publication

A-5,617-20 (December 15, 1920) Method for regenerating and refining rubber scrap. Plauson's Forschungsinstitut, G. m. b. H., Hamburg.

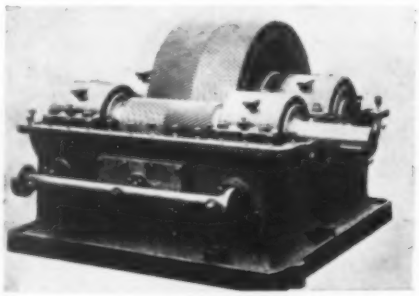
MACONITE CABLE INSULATION

A new surface wiring system that requires no bonding embodies the insulation of the metallic conductors by maconite, a new plastic dielectric composition which both insulates and mechanically spaces the wires apart. The claim is made that this material supersedes vulcanized rubber.—The Macintosh Cable Co., Ltd., Derby, England.

New Machines and Appliances

Improved Helical Gears

DOUBLE helical gearing has in many cases replaced spur gears for power transmission in rubber mill machinery of modern design. A new method for generating double helical gearing covered by the "Sykes" patents makes it possible to apply double helical gears more economically because they can be made smaller and more efficient. The gears generated by this system give better results at all velocities.



Sykes Double Helical Gearing

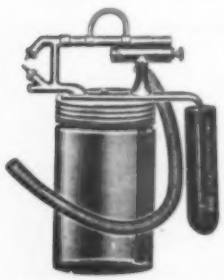
The new principle makes it possible to generate double helical gearing with continuous teeth, having pointed apices. That is, the right and left portions of the teeth are joined at the center, whereas hitherto the gap between these portions of the teeth has always detracted from the face width of the gears. Elimination of the gap increases the load-carrying capacity of the gear from 15 per cent to 25 per cent, reduces expense in manufacture, saves space, and makes possible the application of machine-cut double helical gears where before they were found impractical.

With this process it is possible to generate teeth of great precision as regards profile, accuracy of division, and helix angle. The gears, as a result, run silently and without vibration even at the highest speeds.

Gears ranging in size from ⅛ to 180 inches diameter with ½ to 54 inches face width can be cut by the "Sykes" process. Any speed can be had up to a peripheral velocity of 12,000 feet per minute, and any desired ratio of reduction up to 100 to 1, in single reduction, and 200 to 1 in double reduction.—The Farrel Foundry & Machine Co., Ansonia, Connecticut.

Eureka Pneumatic Mold Sprayer

It is common rubber manufacturing practice to treat rubber molds with a solution of soap to prevent the goods from sticking in the mold. For this purpose a flat bristle brush is commonly used. The operation of slicking the molds is usually performed in haste and consequently is unevenly done, with the result that the molded piece adheres and the mold gets fouled and requires frequent thorough cleaning.



Soap Solution Sprayer

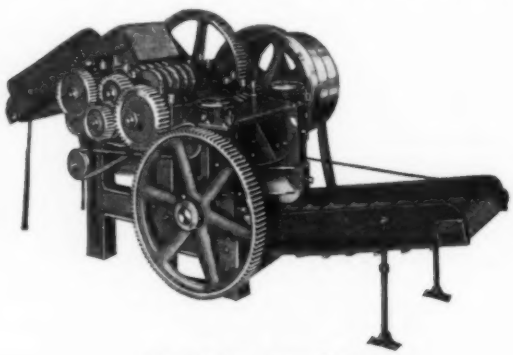
In the illustration is shown a device designed for the purpose of applying soap solution of proper strength to rubber molds by spraying. The sprayer has a downward angle of delivery, and is equipped with an agitator for keeping the soap solution bubbling. By means of this tool the soap can be quickly and thoroughly applied to the mold.

By thus avoiding excess application of soap the appearance of the goods is improved and much less frequent cleaning of molds is necessary.—Eureka Pneumatic Spray Co., Inc., 130th street, Queens Borough, New York, N. Y.

Rag and Stock Cutter

A rag cutting machine is here shown which for many years has been used in paper mills for cutting rags fine for the bleaching boilers. This stock cutter is built on scientific principles to hold up to severe duty for years, with expenditure of a small amount of power. It would be effective in cutting proofed fabric scrap and similar factory waste for reclaiming or remilling.

In operation, the rags are placed onto the feed apron at the top and fall between corrugated knives or slitters which constantly rotate and slit the rags into strips. These are then stripped from the slitters by another set of corrugated rolls, called the clearers, and fall onto the intermediate or slat apron. This feeds the cut



The Perkins Scrap Cutter

stock to the fly knife or spiral which turns against a stationary bed knife. The cut rags then fall to the delivery apron.—B. F. Perkins & Son, Inc., Holyoke, Massachusetts.

Tire Repair Form

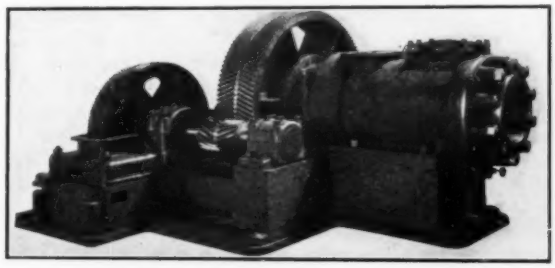
The tipping form here illustrated is an efficient means of securely holding a tire in a convenient position for preparing both side walls and tread for repair. It may be tilted into any desired position enabling one to prepare the tire without removing it from the form. To tip the form it is only necessary to loosen the hand nut on the swivel and the tire may then be instantly tipped either forward or backward to a horizontal position, thus bringing either side wall on top.

Universal Tipping Form

The tire forms are of semi-steel, light weight yet almost unbreakable and are instantly detachable. The bench bracket is of heavy cast iron and when not in use may be swung under the bench.—T. L. Harkins Machine Co., Boston, Massachusetts.

Low Type Tubing Machine

A low type, heavy duty tuber here illustrated is designed with cylinder, head and worm constructed to withstand the greatest



Allen Low Type Tuber

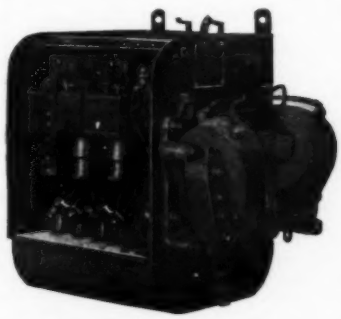
strains and is chambered to insure thorough and properly graded distribution of temperature to the stock being worked.

The worm is cut from a solid steel forging and has decreasing pitch to produce great volume of stock with minimum heat at maximum speed. It is bored for water circulation with increased chamber at the delivery end. The thrust of the worm is absorbed by marine type thrust bearing of ample surfaces.

The feed box is large, permitting a constant and even feed to the worm. The cylinder has renewable bushing within which the worm revolves. Herring bone cut spur gears, entirely enclosed, transmit the driving power. Different interchangeable head sections render the machine practically universal in its adaptation to the production of hollow and solid shapes.—Allen Machine Co., Erie, Pennsylvania.

Automatic Auto-Starter

The entire operating mechanism of the auto-starter for squirrel cage induction motors, here shown, is enclosed, the covers being quickly removed for installation and inspection purposes. The tank enclosing the contacts can be quickly dropped, thus exposing the contacts to view for inspection or replacement.



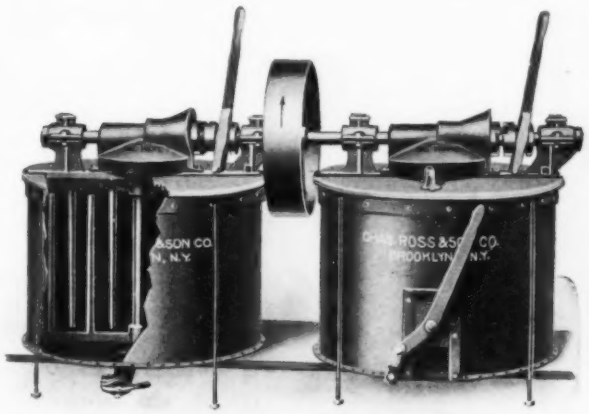
Westinghouse Auto-Starter

The auto-transformer has well insulated coils, provided with taps for adjusting the starting voltage and, consequently, the starting torque. The rolling type contacts provide for initial contact at the tips and final contact at the heel and insure long life with infrequent replacements. Both starting and running contacts are of the same size and actuated by a mechanism which automatically closes the starting contacts first, holds them closed for a predetermined time, and then automatically opens the starting contacts and at once closes the running contacts.

The moving armature, which is common to both magnets, rotates the shaft which carries the main contacts. Interlock fingers are connected to the rotating shaft so that when the starter is in the running position these fingers make a circuit which maintains itself through the run magnet. The run magnet, therefore, also functions as a low voltage relay. The control relay is given a definite time limit by means of a dash pot so that the time of starting a motor can be adjusted for any period up to a maximum of 15 seconds.—Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania.

Rubber Cement Mixers

The illustration shows a pair of rubber cement mixers arranged as a gang. The internal mechanism is shown in the part sectional view which represents as well the bottom liquid gate. A quick-opening side lever gate, as seen on the right-hand mixer, can be used according to the consistency of the product. Any number or size of mixer can be thus arranged in groups. The gangs or groups are driven by a single tight pulley or by a tight and loose pulley on one horizontal driving shaft. Each mixer has a pair of covered bevel gears with a clutch on back of the driving pinion, and by means of a lever they can be operated independently of each other.—Charles Ross & Son Co., Brooklyn, N. Y.



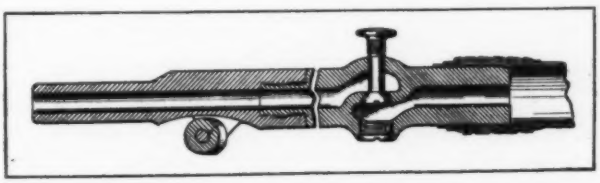
Ross Improved Cement Churns

Machinery Patents

Tube-Stripping Nozzle

The improved tube-stripping nozzle here shown in longitudinal section presents several new features over the ordinary nozzle. The valve is the spring-closed plunger type and the detachable nozzle section carries a roller set at an angle, permitting the tool to roll straight along the poled tube as it is withdrawn from the mandrel.

In operation, one end of the tube is partly turned back upon itself over the top of the nozzle, the operator admits compressed air within the turned back portion of the tube and walks backward,



Nozzle for Stripping Tubes

drawing with him the turned back tube end and nozzle.—Charles E. Maynard, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts. United States patent No. 1,445,701.

Washed Rubber Drier

The apparatus shown in Fig. 1 is designed for drying washed rubber rapidly under controlled conditions. Washed and sheeted crude rubber direct from a washing mill enters the drying chamber at A over a roller and between two air jets B, which blow off practically all adhering water. The drying stack comprises five steam-heated rolls placed over one water-cooled roll. Around these rolls are threaded two endless blankets of porous quality between which the wet rubber is conveyed, confining it against undue expansion or bubbling, as is likely to occur when heat is applied to rubber containing moisture. Due to the high humidity conditions between the belt conveyors, the rubber is dried rapidly and without injury.—Glen B. Britton, assignor to The Firestone Tire & Rubber Co., Akron, Ohio. United States patent No. 1,440,371

Making Hollow Rubber Articles

The machine illustrated in Fig. 2 provides an economical method of producing a hollow rubber article of any shape or size, which will have walls of uniform thickness. Rubber sheet stock is uniformly drawn or stretched over its entire area to form the halves of a hollow article producing uniform walls. The method also includes the sucking of stock into a form or mold, the latter being in general configuration of the part or half of the article being made.

The press, two views of which are shown, is built on a base with side rods serving as supports for the upper section and guides for the movement of the lower one. The latter comprises a fixed air cylinder A surrounded by another cylinder B, which slides upon it and carries the forming mechanism of the lower section, the feature of which is a number of section plungers. These plungers are actuated by the upward and downward movement of B and serve to suck downward a sheet of rubber laid upon the lower half molds, forming half the hollow object, as at C. The mechanism of the upper or fixed head of the press is essentially the same as that of the lower section in reverse position, the suction plungers, air actuated, sucking up a rubber sheet to form the upper half of the hollow object.

The view shown on the right represents the press closed. In this position the cutting edges of the mold cavities sever the surplus stock and the pressure of closing unites the halves of the object into a complete hollow object, D.—Arnold L. Schavoir, Stamford, Connecticut. United States patent No. 1,441,603.

Machine for Building Cylindrical Tire Blanks

An apparatus for building cylindrical tire blanks on the so-called drum building machine is here shown in front elevation with arrangement of overhead driving mechanism.

The building drum, A, comprises four sections supported on the same shaft, from which they are demountable. They are provided with grooves to receive the tire beads, and are formed in four segments each, for removal from the tire blank. For the purpose of operating upon the layers of fabric wrapped about the drum various tools are used, and these are required to be positioned along the face of the drum. To hold and operate these tools a rotary turret mechanism is provided mounted upon sliding ways.

In operation, the prepared fabric strips are brought from the rear by an apron conveyor C, and over the drums at a speed corresponding to the drums. The strip is wrapped about the drum and smoothly pressed down by a pressure roller. The fabric extends from end to end of the drum and is of a length sufficient to form one layer of a number of separate and distinct tire blanks.

After the first layer of fabric has been shaped to the grooves a second layer is laid about the drum and closely pressed to the first one. This layer is wrapped in a direction opposite to the first one by reversing the drum with each successive layer.

After sufficient layers have been applied, they are cut and stitched to the widths. Then the bead material is applied at the grooves and covered, when the remaining fabric plies and outside rubber and tread parts are added. The sections of the drum are then removed and collapsed and separated for removal of the tire casing blank.

The tire blanks are completed by turning in the chafing strip and the edges of the layers projecting beyond the bead.—Barthold de Mattia, Clifton, New Jersey. United Stated patent No. 1,442,653.

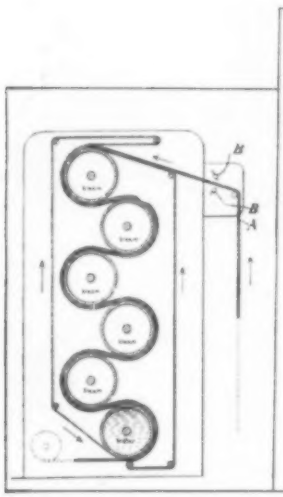


Fig. 1. Rubber Drier

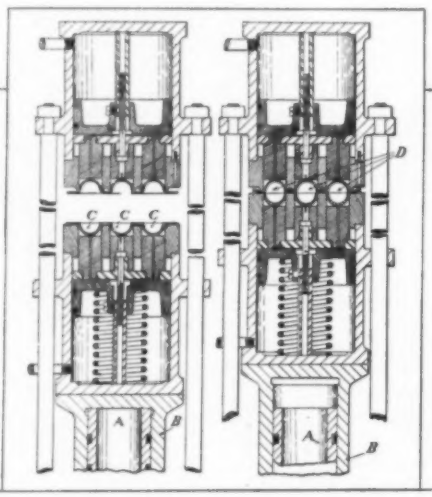


Fig. 2. Machine for Blown Goods

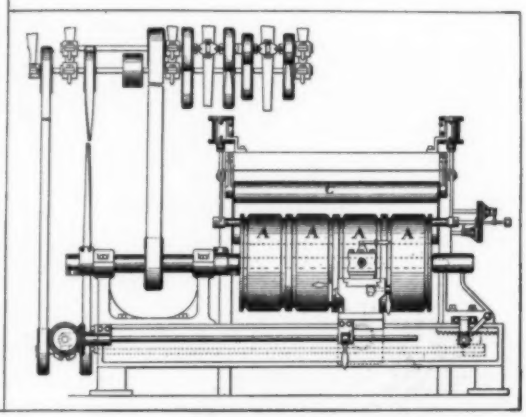


Fig. 3. De Mattia Tire Builder

Other Machinery Patents

The United States

1,444,789 Vulcanizing apparatus. A. W. Herling, Chicago, Ill.
1,444,911 Tubing die for solid tires. D. E. Goodenberger, assignor to The Firestone Tire & Rubber Co.—both of Akron, Ohio, U. S. A.
1,445,327 Machine for grinding battery jars. E. J. Kroeger, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.
1,445,428 Tire retreading device. J. D. Williford, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.
1,445,990 Machine for cutting sheet rubber. S. W. Bourn, Bristol, R. I.

1,446,300 Recording gage for sheet stock. G. L. Lawrence, Jr., Melrose, and L. A. Field, Malden—both in Mass., assignors to Boston Rubber Shoe Co., a Massachusetts corporation.

1,446,478 Press vulcanizer. M. B. Newcomb, Akron, assignor to The Wellman Seaver Morgan Co., Cleveland—both in Ohio.

1,446,504 Tire deflating device. H. M. Howell, Monroe, La.

1,446,755 Tire forming machine. J. D. Lacroix, New Orleans, La., assignor to Kelly-Springfield Tire Co., a New Jersey corporation.

1,446,885 Appliance for covering balls. I. de Gowin, assignor to The Seamless Rubber Co., Inc.—both of New Haven, Conn.

The Dominion of Canada

128,040 Conveyor system. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of H. J. Hoyt, Detroit, Mich., U. S. A.

228,041 Tire building apparatus. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of C. M. Sloman, Detroit, U. S. A.

228,251 Cutting machine. The Capen Belting & Rubber Co., assignee of C. E. King—both of St. Louis, Mo., U. S. A.

228,370 Tire valve. G. J. Olafson, Dafoe, Sask.

228,402 Bead cable for automobile tires. The International Bead Wire Co., New York City, assignee of A. C. Pratt, Deep River, Conn.—both in the U. S. A.

228,546 Tire rim contracting device. G. S. Webb, Aurora, Ill., U. S. A.

228,559 Mold for heavy truck tire flaps. The Canadian Consolidated Rubber Co., Montreal, Que., assignee of A. A. Abbott, Jr., Detroit, Mich., U. S. A.

228,722 Apparatus for forming sheet tiling. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of W. J. Kent, Brooklyn, New York, U. S. A.

228,723 Machine for forming sheet tiling. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of W. J. Kent, Brooklyn, New York, U. S. A.

228,756 Rim tool. F. R. Hartsock, C. O. and L. E. Dickey, assignee of ⅓ of the interest—all of Warsaw, Ind., U. S. A.

The United Kingdom

190,383 Vulcanizing apparatus. W. Frost and H. Frost & Co., Limited, 148 Great Portland street, London.

191,308 Molds for vulcanizing tires. W. J. Bowker, 35 Temple Row, Birmingham; H. J. Doughty, Providence, R. I., U. S. A.

191,462 Adjustable calliper gage for tires. W. Frost and H. Frost & Co., Limited, 148 Great Portland street, London.

191,487 Apparatus for treating latex. Sir H. A. Wickham, and Roa, Limited, 9 Fenchurch avenue, London.

Germany

Patents Issued, with Dates of Issue

370,108 (September 14, 1920) Dipping machine. Max Draemann von Sandtplatz 1, Köln-Deutz; and Max Bühling, Richlerstrasse 88, Köln.

370,109 (November 15, 1921) Bias cutting die, for soft material, especially rubber. Mittelland-Gummiwerke A.-G., Hannover-Linden.

371,207 (July 15, 1921) Vulcanizing device. Franz Beas, Wernerstrasse 13, Dresden.

372,012 (September 27, 1921) Device for making seamless rubber goods after the dipping process. Albert Boecler, Malmö, Sweden; represented by Dr. R. Specht, Hamburg 1.

372,214 (April 15, 1921) Rubber cord press. Hermann Berstorff Maschinenbau-Anstalt G. m. b. H., Hannover.

372,215 (October 25, 1921) Grating disk with exchangeable teeth, for horn, hard rubber and the like. Carl Spies, Kellerstrasse 2, Elberfeld.

361,569 (October 16, 1922) Handpress for vulcanizing defective tubes. Arnold Max Brée, Berlin-Friedenau.

Design Patents Issued, with Dates of Issue

836,831 (July 19, 1922) Machine for attaching rubber heels and soles without nails. Carl Brebeck, Unterdörnerstrasse 39, Barmen.

837,039 (November 20, 1922) Vulcanizing apparatus for defects in bicycle tubes and covers. Herbert Raether, Losthinstrasse 1, Leipzig-Wahren.

837,091 (January 6, 1923) Device for attaching rubber heels. Gustav Adolf Jakubowsky, Glasstrasse 16, Mannheim.

837,174 (February 28, 1922) Packing for pistons moved by air-pressure. Henry Carl Johannes Sachau, Neumunster.

Austria

Patents Issued, with Dates of Publication

A-6189-21 (December 15, 1922) Tool for vulcanizing tire treads. A. Loeffler, Vienna.

DURING 1922 THE EXPORTS OF RUBBER FROM PARÁ, MANAOS, AND Itacoatiara, Brazil, and Iquitos, Peru, amounted to 22,911 metric tons, as compared with 18,567 metric tons in 1921. The United States took 49 per cent of the 1922 exports, while her share in 1921 was 61 per cent.

Process Patents

Rubber-Casein Vulcanized Products

An interesting and promising development in the rubber industry is that recently patented in which casein or caseinous materials are added to the latex of rubber, balata, gutta percha, etc., or combined with these gums alone or in admixture with an even larger range of compounding ingredients than now used as components in the making of both hard and soft rubber products.

An example of such a composition, expressed in parts by weight, is as follows: Rubber, 30; sulphur, 5; zinc oxide, 40; lampblack, 5; litharge, 5; antimony sulphide, 5; casein, 10. Any of the above ingredients, such as the zinc oxide, lampblack, litharge and antimony sulphide, may be omitted or their proportions changed, dependent on the use to which the composition is to be put.

The important feature of the compound is the addition of casein or similar material with the rubber or rubber-like material and whatever other ingredients may be found of value in the compound. The range of usefulness of these compositions is claimed to be coextensive with that of rubber compositions in both their hard and soft rubber applications.—Arthur Biddle, Trenton, New Jersey, assignor to United Products Corp. of America. United States patent No. 1,457,487.

Other Process Patents

The United States

1,444,459 Method of rubberizing fabric. F. C. Hall, assignor to Jenckes Spinning Co.—both of Pawtucket, R. I.

1,445,626 Method of making tires for carpet sweepers. W. J. Kent, Brooklyn, N. Y., assignor to The Mechanical Rubber Co., a New Jersey corporation.

1,445,745 Method of marking tires. J. W. Burke, assignor to The Fisk Rubber Co.—both of Chicopee Falls, Mass.

1,446,025 Method of forming gaskets and applying the same to can necks, etc. W. J. Towle, St. Paul, Minn.

1,446,737 Treatment of raw rubber and the like plastic substances. S. C. Davidson, deceased, late of Belfast, by F. G. Maguire, Bangor, A. Agar, Holywood, and H. T. Coulter, Belfast—all of Ireland.

The Dominion of Canada

228,333 Method of attaching soles and heels. G. E. Heldinstein, assignee of F. Lee—both of Norwich, Norfolk, England.

228,396 Process of vulcanizing rubber. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of S. M. Cadwell, Leonia, N. J., U. S. A.

228,737 Manufacture of rubber jars. The Rub-Tex Products, Inc., assignee of L. E. Klug—both of Indianapolis, Ind., U. S. A.

The United Kingdom

191,421 Plastic composition. I. Manchester, Waterhof, Hof street, Cape Town, South Africa.

191,446 Mixing latex with paper pulp. F. Kaye, The Laurels, Park avenue, Ashton-on-Mersey, Cheshire.

Austria

Patents Issued, with Dates of Publication

371,517 (January 17, 1922) Process of applying rubber to soles or heels. Artur Lauterjung, Hilden, Rheinland.

RUBBER EXPORT ASSOCIATION FORMED

Three important rubber manufacturing organizations have united in the formation of a concern to be known as The Rubber Export Association, and have filed papers with the Federal Trade Commission for incorporation under the Webb-Pomerene Export Trade Act. The three companies concerned, which will retain their own individuality and trade marks, are The United States Rubber Export Company of New York, The Goodyear Tire & Rubber Export Company, Akron, Ohio, and The Miller Rubber Export Company, New York. Under the provisions of the Webb-Pomerene Act such associations are exempt from the operation of the anti-trust laws in their export trade.

Executives of the new association are: A. M. Cameron, R. H. Byrne, and E. H. Huxley, while J. B. Tower has been named secretary. Offices will be maintained at 1790 Broadway, New York, N. Y.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(164) Inquiry is made for a cement to be used with ordinary patching rubber stock for inner tubes—one that does not need to dry before patch is placed.

(165) Addresses are desired of manufacturers of steam jacketed tire molds.

(166) A resident of Argentina wishes to know where he can procure uncured hard rubber.

(167) A subscriber asks for names and addresses of manufacturers of machines for cutting bales of rubber into slabs.

(168) An inventor wishes to get in touch with manufacturers of cup-like articles of either hard or soft rubber.

(169) A reader wishes addresses of dealers in surgical webbing, rubberized cotton goods for household aprons, and hospital sheeting.

(170) Inquiry is made for sources of supply of sponge rubber.

(171) A prospective manufacturer of rubber bands wishes the names and addresses of makers of band cutting machines.

(172) We are asked for addresses of manufacturers of rubber sacs for fountain pens.

(173) Inquiry is made relative to manufacturers of rubber drill.

(174) A reader wishes to get in touch with manufacturers of rubber bath spray brushes.

(175) Inquirer wishes to be advised where he can purchase a rubber testing machine which will turn tires at a speed of 50 tires per hour, under a load of about 3,000 pounds.

(176) Addresses of dealers in hard rubber are asked for.

(177) Names and addresses are desired of manufacturers who might be interested in making under contract a specialty tube for tires, one which would require the usual equipment.

(178) Addresses are desired of firms specializing in scrap rubber for reclaiming purposes.

(179) We are asked for the address of a manufacturer of power knives for cutting crude rubber.

(180) A reader asks where he can procure vertical hydraulic presses.

(181) Inquiry is made for the address of the Oriental Packing Co.

(182) The name and address of the manufacturer of "Indian Flyer" rubber heels are asked for.

(183) Information is desired as to where a black cloth, rubber-lined hose, 5/16 or 3/8 inch diameter, may be obtained.

(184) A subscriber asks for addresses of manufacturers of bead flipping machines.

(185) We are asked for a list of manufacturers of molds and vulcanizers for repairing rubber footwear.

(186) A reader wishes to get in touch with manufacturers of rubber push balls from 5 to 6 feet in diameter.

(187) A subscriber asks for addresses of manufacturers of equipment for making playing balls.

Foreign Trade Opportunities

Addresses and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Requests for each address should be on a separate sheet and state number.

(5419) Rubber heels—Norway. Purchase. Quote c. i. f Norwegian port.

(5436) Automobile tires of the better grade, in metric and inch clinchers—Hungary. Agency. Quote c. i. f. Hamburg.

(5442) Tires—Algeria. Purchase and agency. Quote c. i. f Algerian port.

(5460) Materials for vulcanizing and repairing worn tires and tubes—Syria. Purchase. Quote in French c. i. f. Syrian port. Terms cash; in United States currency.

(5513) Rubber goods, including tires and tubes—Denmark Agency.

(5531) Machines for punching holes from 5 to 25 millimeters and from 10 to 20 centimeters in diameter, at any desired interval, in rubber strips ¾-inch thick—France. Purchase. Quote in French c. i. f. French port.

(5585) Rubber hose of various grades; hardware; fire extinguishing apparatus—Manchuria. Purchase.

(5602) Sporting goods for tennis, golf, and boxing; toys—Bolivia. Purchase or agency. Quote c. i. f. Antofagasta or Arica, Chile.

(5623) Rubber tubes—Argentina. Agency. Quote in Spanish.

(5648) Rubber floorings—Netherlands. Purchase and agency. Quote c. i. f. Rotterdam or Amsterdam. Cash against documents.

(5649) Rubber boots, sizes 7 and 8, knee and hip length, of medium quality, for use by cement workers, about 15 dozen annually—Japan. Purchase. Quote c. i. f. Japanese port. Terms cash.

(5650) All kinds of floor-covering materials, such as linoleum and cork and rubber mats—Switzerland. Purchase. Quote c. i. f. Antwerp or Genoa.

(5733) Automobile tires, casings and inner tubes, and accessories—Germany. Agency. Quote in German.

(5734) Rubber play balls, hygienic rubber goods, raincoats, auto and motorcycle tires, rubber hose, rubber toys, etc.—Belgium. Purchase and agency. Quote c. i. f. Belgian port. Cash against documents.

(5735) Heavy rubber overshoes of first quality, and rubber-soled sport shoes, in very large quantities—Syria. Purchase or agency. Quote c. i. f. Beirut or Haifa. Terms: 25 per cent with order; balance upon receipt of goods.

(5736) Surgeons' gloves—Norway. Agency.

(5764) Golf balls—India. Agency.

(5765) Tennis balls and sporting goods—Italy. Agency.

Trade Lists Available

Mimeographed copies available on reference to titles and file numbers.

Rubber goods, importers and dealers, Bolivia, LA-11022.

Rubber goods, importers and dealers, Ecuador, LA-15011.

Rubber goods, importers and dealers, Dominican Republic, LA-31025.

HOME AND CITY BEAUTIFUL EXPOSITION

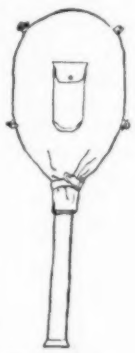
Extensive plans have been prepared by The American Home and City Beautiful Association, Atlantic City, New Jersey, for an exposition in that city to continue from June 16 to September 8, 1923. This ambitious plan for an American industrial fair has been organized partly in response to the wishes of American manufacturers desiring to display their goods and partly through many who are interested in promoting not only beauty in the home but needed developments and improved conditions in municipalities as well.

For housing this exhibition, which will be devoted to eight principal groups of displays with allied classifications, all of the floor space of Atlantic City's Million Dollar Pier has been engaged, this comprising more than 100,000 square feet. It is noted that rubber products will be on view as one of the special features. In planning this fair the management adopted the following slogan: "An exhibit to show Americans how to make homes and cities brighter and better in every way—to boost American industries and make good times stay."

New Goods and Specialties

Waterproof Coverpress for Tennis Racket

THE two-in-one idea is brought out practically in the combination of a waterproof cover and press for the tennis racket, shown in the accompanying illustration. The outside of the cover is of waterproofed material and the inside of cotton cloth, giving double protection against dampness. At the same time it securely locks the racket with wing nuts, which are incorporated in the cover so that they cannot be lost, as in the case of the ordinary press.—The Phoenix Sporting Goods Manufacturing Co., Philadelphia, Pennsylvania.



The "Treacy Coverpress"

Stitchless Tennis Balls

The Pennsylvania tennis ball has already made its reputation for resiliency, perfect bound, and scientific weight balance. In the stitchless ball illustrated these qualities are all emphasized. The balls are sold direct to the sporting goods trade from the factory or its branches and generous margins of profit are assured, with a guarantee of prompt shipment and absolutely fresh, lively balls.—Pennsylvania Rubber Co. of America, Inc., Jeannette, Pennsylvania.

The Stitchless Ball

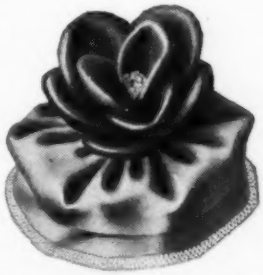
Packaged Golf Balls

The individual container in which the Huntington Manufacturing Co. is sending out its new line of golf balls, the "gray goose" and the "jack rabbit," is designed to make window display of the balls a satisfaction to dealers. They may be squared, pyramided, or used to form letters or words, and the various sketches of "Br'er Rabbit" which appear on different sides of the carton add to the attractiveness of any scheme.—Huntington Manufacturing Co., Philadelphia, Pa.

The "Jack Rabbit" Ball

Rubber Powder Puff Pocket

There is every indication that the attractive little powder puff pocket shown in the illustration will be in popular demand for the summer vacation period. It is made of rubber in five different color combinations and in several styles. Some of these styles have rose adornments on top, like the one shown, and others have ruffled tops with decorative rubber bands. The puffs are of white velour. The sets, powder puff and pocket, are packed two dozen in a special display box.—The I. B. Kleinert Rubber Co., 725 Broadway, New York.



Kleinert Rubber Powder Puff Pocket

Fish Lure With Rubber Wings

The "Mizzouri Bug Wobbler," a fish lure recently marketed, has a side-to-side wiggle in the water which might even deceive a fisherman into thinking it something alive. It has a wooden body with wings of white rubber, which in action resemble pork bait. A red or natural bucktail is also provided. Each lure is supplied with two sets of wings, which are easily adjusted or removed. It is substantially made, weighs only three quarters of an ounce, and may be had with either green, white, red, or black body. The hook is a 3-0.

The "Mizzouri Bug Wobbler"

Another "action" bait which to a large extent takes the place of pork bait, made by the same company, is composed entirely of white rubber, has hook and bucktail, and also has a very much alive look when it is reeled in.—Mizzouri Bait Co., St. Louis, Missouri.

Another "Action" Bait

Balloon Novelties as Funmakers

The novelty balloon has won a place for itself as a funmaker, and some of the most successful designs on the market at present are included in the line put out by the Anderson Rubber Co. Heading their list is "Billy Whiskers," the goat of the group. He blows up to about five inches in height and stands on wooden peg legs. The more he is blown up the more pathetic becomes the expression of his eyes. When fully inflated, a slight tap with the finger or a breath of air will cause him to buck and caper on a polished surface, and to shake his green whiskers sorrowfully.

Billy Whiskers

The great mystery of lifting the 500-pound weight shown in the second illustration is revealed when it is discovered that the "weight" is made up of two balloons, connected by a wooden handle. This is a very popular number and a good seller.—Anderson Rubber Co., Akron, Ohio.

Dumb-bell Balloon

Hard Rubber Cue Ball

A substitute for the expensive ivory cue ball has been developed in one of colored hard rubber, by Robert J. Wilkie, of Newton Center, Massachusetts. The trade has taken very kindly to it and it has proved capable of standing up well under any kind of treatment.

THE NOVELTY RUBBER SALES CO., AKRON, OHIO, IS OFFERING TO the balloon trade a line of extra fine quality and in most attractive colorings. Their "De Lux Combination" is a compartment box containing a gross of the balloons and featuring six different styles. There are airships tinted in gold and silver, and round gas balloons with long necks and heavy bead, beautifully finished and colored in gold, silver, red, green, and blue.

A Pneumatic Automobile Seat

The pneumatic auto seat here pictured is a practical application of the air cushion. The heavy rubber lining of the seat is encased in tough, rubber-covered upholstery that looks like leather. It can be deflated, rolled up and packed in a grip, or it can be used as an air pillow for the camp or as a life preserver in

The Goodrich Air-Cushion Seat

a canoe. It is adjusted to one's personal comfort by inflating or releasing the air as desired, and acts as a buffer or shock absorber on the road.—The B. F. Goodrich Rubber Co., Akron, O.

Inflated Balloon Device for Teaching Swimming

The novelty in safety swimming devices here shown will be of interest to sporting goods dealers for the coming vacation period trade. It is designed to relieve any sense of timidity in those just learning to swim and will, no doubt, be popular, since it will support in the water a body weighing as much as 300 pounds, the inventor claims, without any effort on the wearer's part. It is composed of a casing made of fabric divided into two compartments, into each of which is fitted an elongated balloon of the "airship" variety. These balloons, when inflated, will hold the air for several days. Straps are provided which fasten around the body and over the shoulders, so that the device cannot get out of position. It holds the body in the correct position for swimming and does not interfere with freedom of movement of the arms or legs. As it almost entirely covers the back, it makes an excellent float as well as an aid in learning to swim.—L. A. Swineford, Patentee, Ashland, Ohio.

The Swineford Safety Swimming Device

Rubber Quoits for Deck Tennis

One of the new games of the season is an adaptation to land uses of the popular shipboard game of deck tennis, known as "Dek," the outfit for which consists of a very light cotton net and standard corrugated hollow rubber quoits. The game may be played almost anywhere where the courts may be marked off and the net attached, by means of the metal eyelets at each corner, to sidewalls or posts. The posts are not furnished. The patented hollow rubber quoits outlast by two or three times the ordinary rope or twisted cord ring.—"Dek" Game Company, 560 Sutter street, San Francisco, California.

Wrapping Tapes for Tires and Hose

Probably by far the largest proportion of tires made today are mold cured rather than open steam cured. The latter method requires that the tire be specially wrapped for curing with strong strip material. Specially woven tapes with or without loop edges are made for this purpose. These are far more durable and convenient than strips torn from wide goods and are equally desirable for hose and other wrapped work as well as for tires.—Anchor Webbing Co., Pawtucket, R. I.

Tire Rim Collapser and Expander

The labor saving tool here shown is designed to expand and collapse a rim so that the tire may be removed in 30 seconds from the time the operation is started. The device is of sturdy construction and applicable to practically all makes of split rims.

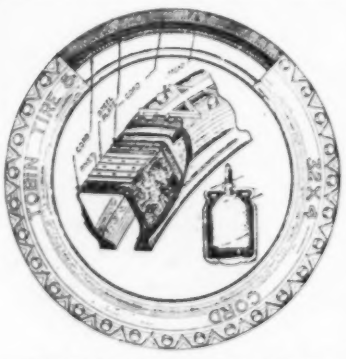
International Rim Tool

The action of the tool is simple. It is applied to the rim by wing nuts at the end of the eccentric bolt. Releasing the latch on the top of the device allows the eccentric bolt to be turned to opposite position, lengthening the device and spreading the ends of the rim. The latch on top is then reversed, locking the eccentric bolt. When the tail end of the tool is lifted with the lever wrench the action will collapse the rim. With the rim fully collapsed in this manner the tire is removed easily. Rusted rims in no way retard the speedy action of the tool.

After replacement of tire on the rim without the aid of any tool the lever wrench is reversed, expanding the rim inside the tire. The spread ends of the rim are brought together in proper position by releasing the latch and turning the eccentric bolt.—The International Auto Device Co., State Lake Building, Chicago, Illinois.

A New Armored Tire

In the Tobin tire shown in the illustration the outstanding characteristic is the armored tread portion of the casing, which embodies flat, overlapping steel plates extending from wall to wall and secured by rivets to cord plies and an interposed rubber layer. There are approximately 150 plates to a 30 by 3½ inch tire, which causes it to weigh 1½ pounds more than the standard pneumatic tire. This puncture-proof tread operates in conjunction with a pneumatic inner tube requiring only the usual amount of inflation.

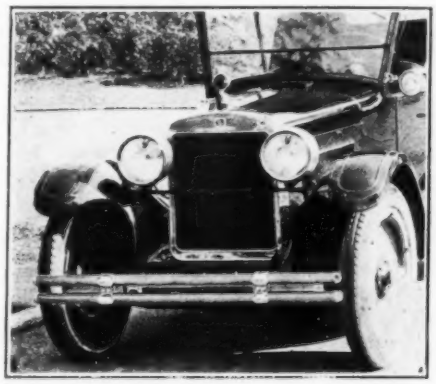


The Tobin Puncture-Proof Tire

The casing is channel-shaped in cross-section, the side walls being flat and parallel and the tread portion slightly curved at the corners. The armored tread is vulcanized to and made an integral part of the tire casing.—Nathan L. Tobin, Inventor, 3511 W. Fifth avenue, Chicago, Illinois.

Rubber Bumper for Automobiles

The "Volco," the newly patented rubber coated bumper shown in the illustration below, embodies some very special features. High carbon steel tubing is its foundation, coated completely with a quarter inch of live rubber. The toughness and vitality of the rubber make the bumper vibration-proof and prevent clatter. In the sudden impact of collision the cushioned contact of the rubber not only takes up the jar, protecting the car and its inmates from the shock, but also lessens the liability of damage to the other car. It is mounted on powerful steel spring arms, which add to its own patented advantages the resilience of the best spring type of bumper. The color, which is ingrained in the rubber and therefore cannot chip off or fade, may harmonize with the car, as there



The "Volco" Rubber Coated Bumper

is a wide assortment of finishes—black, white, gray, yellow, green, blue, maroon, and red. The ends are nickel capped, and universal fittings make attachment easy.—Volator Co., Inc., 600 North Michigan Avenue, Chicago, Ill.

Mexican Rubber Soles

A patented molded full sole and heel invented and made in the city of Mexico is offered as possessing the advantages of permanent attachment to the leather shoe bottom by means of cement instead of by sewing. The heels are attached and the wearing surfaces of sole and heel are molded with corrugations to prevent slipping. The upper surface is molded hollow to conform to the leather shoe bottom. These features are shown in the illustration.—International Co., S. A. Av. Uruguay 29, Mexico, D. T.

"International" Soles

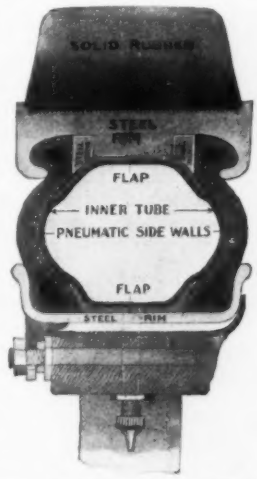
Self-Vulcanizing Tire Patch

The "Wear Ever" patch may be applied to anything that has a rubber surface, such as automobile inner tubes, hot water bottles, ice bags, raincoats and hats, garden hose, auto tops, and casings. It requires no heat, cement, or gasoline, and is guaranteed not to slip, leak, or creep in hot or cold weather or under most trying conditions.—The Wear-Ever Patch Mfg. Co., Inc., Columbus, Ohio.

New Heavy Duty Semi-Pneumatic Tire

The inventor of the heavy duty pneumatic tire shown in the accompanying illustration, admits that it will cost more to build this tire than it does for the ordinary pneumatic tire, but this is offset by the fact that its life is doubled and perhaps tripled by its special features.

It cannot be punctured through the tread, and the sidewalls are so protected by the rim that when driven in a rut there is no unusual wear on the tire because the steel rim widens the rut sufficiently to allow the sidewalls to pass through untouched. If a sidewall should at any time be punctured or torn it can be replaced at slight expense. The wearing parts are of rubber, and if the tread wears out it too can be replaced. Unlike the solid tire, which loses its resiliency when the rubber is worn half down, this tire when the rubber is worn down to the steel rim retains its resiliency through its pneumatic part, which requires only about half the amount of air usually necessary. It can be used on any rim which will carry a pneumatic tire. The illustration shows the snap rings on the inside which prevent the tread from throwing off. It cannot throw off from the pneumatic section.—Fred H. Wilbur & Son, 21 Wall street, Binghamton, New York.



Cross Section of Wilbur Tire

Rubber Silencer for Auto Hoods

The Jorgensen Hood Silencer

The hood silencer shown in the illustration is made in one piece of the best quality of rubber and weighs less than one ounce. At one end of it there are two cleats or grips; at the other is a vacuum cup arrangement. By slightly pressing inward on the vaccum end the cleats separate sufficiently to allow the silencer to be securely adjusted to the hood fastener, the slanted hole in the silencer conforming to the slant of the fastener. The silencers fit snugly and hold tightly, so that all rattles are eliminated from the hood. They can be used on Dodge, Peerless, Buick, Studebaker, Chandler, Chalmers, and several other makes of cars.—Jorgensen Hood Silencer Co., Erie, Pennsylvania.

Swimming Tube with Protected Valve Stem

The use of the inner tube of an automobile tire for a swimming tube is no longer novel, but the protruding valve and valve cap have been a disadvantage. The "Evergreen" swimming tube employs a "Schrader" valve with the stem mounted within the tube. The outer end of the valve stem extends beyond the surface of the tube only far enough to allow a cap to be threaded on it, the main body of the stem extending inside the tube. The valve cap is vulcanized into a covering of soft rubber, hemispherical in shape and with a concave under surface adapted to fit snugly against the curved surface of the tube. When the tube is inflated the friction between the hood and the tube is sufficient to prevent the accidental unscrewing of the cap.—The Falls Rubber Co., Cuyahoga Falls, Ohio.

Activities of the Rubber Association of America

Discussion of Restriction Crisis

At a meeting of the Board of Directors and Executive Committee held on March 7, the recommendations of the Special Committee on crude rubber restriction made to the Rubber Growers' Committee requesting the release of rubber without regard to quarterly periods or prices, and the abrogation of the entire Stevenson plan were approved. The plans of Secretary Hoover, of the Department of Commerce, for a survey of other sources of rubber supply were also sanctioned.

Mr. Firestone's Views

While expressing his approval of these recommendations, Harvey S. Firestone announced his belief that negotiations with the Rubber Growers' Association would prove to be useless for the reason that the Rubber Growers' Association was a dominant factor in inducing the British Colonial Office to suggest to the Colonial governments the enactment of the export restriction legislation. He further said that because of his strong conviction regarding the ultimate failure of our Special Committee to secure relief through negotiation with the Rubber Growers' Committee he felt impelled to withdraw the representation of his company on the Special Committee during the early stage of its activities and embark on a personal campaign to bring about a repeal of the restriction act by arousing the interest of all manufacturers in the automotive industry and the users of tires and other rubber articles, this action being taken with the view that public sentiment would make a profound impression on those responsible for the enactment of restriction legislation.

Mr. Firestone then referred to the results of a meeting which he held in Washington on February 27 attended by representatives of rubber, automobile and accessory manufacturers, also by representatives of government departments and a variety of associations. He was authorized by those present to appoint a committee of five to prepare resolutions of protest against the restriction act and to arrange for the presentation of these resolutions to the British Government. Mr. Firestone requested the cooperation of the Rubber Association in designating one member of this committee, the other four members to consist of one each from the National Automobile Chamber of Commerce, the American Automobile Association, the Ford Motor Co., and Mr. Firestone as chairman.

Mr. Firestone was most emphatic in his belief that this form of organized effort through the committee personnel was the only effective method to bring about the repeal of the crude rubber restriction act, and because of this belief he could not see his way clear to participate in any other form of cooperative action. Therefore, in the event that the association could not agree with his proposal he would be unable to participate or aid in the association's activities.

Association Approves Special Committee's Action

After considerable discussion each member of the board and the guests present were requested to express their views regarding the activities of the Special Committee and future procedure by the association in this matter, and it was the unanimous opinion of all present, with the exception of Mr. Firestone, that the Special Committee had acted wisely and in the best interests of the industry and consumers of rubber products in negotiating with the Rubber Growers' Association of London.

It was also the unanimous opinion, with the exception of Mr. Firestone, that it would be unwise to attempt any other form of protest until negotiations with the Rubber Growers' Association had failed, and when satisfied of this, it would then be time to approach the problem most vigorously through the Rubber Association only with the full knowledge and cooperation of the United States Government.

It was agreed that any form of protest should not be presented directly to any British governmental office or body but through such instrumentalities as are or may be provided by the United States Government, for the reason that the individual citizen, firms, companies or corporations or groups should indicate their respect for and confidence in our own governmental machinery and follow duly prescribed channels for functioning in matters of this kind.

Cooperation of Association and Government

It was announced that Congress has appropriated $500,000 for the use of the Department of Commerce in making a survey for the purpose of developing new sources of raw materials, including rubber in territory governed by the United States or adjacent thereto, and the association has been requested by Secretary Hoover to appoint an unofficial advisory committee to aid the department in this work when called upon. The directors expressed appreciation of this opportunity to aid the Department of Commerce and appointed the present Special Committee in charge of the crude rubber restriction matter, as the unofficial Advisory Committee. On account of the absence of several members of the committee, five alternate members were appointed. Therefore the complete personnel is as follows:

Special Committee	Alternates
H. Stuart Hotchkiss (Chairman)	C. B. Seger
P. W. Litchfield	G. M. Stadelman
B. G. Work	W. O. Rutherford
Horace DeLisser	J. C. Weston
A. H. Brown	W. E. Bruyn
W. O'Neil	
Wm. Pfeiffer	

Chairman Hotchkiss of the Special Committee will remain in or near London and continue negotiations with the Rubber Growers' Association with the view to bringing about definite action with their delegates.

Division and Committee Meetings

On March 16 the Tire Specification Committee met in the association offices and presented to representatives of the Bureau of Standards recommendations as to desirable specifications for pneumatic and solid tires and inner tubes.

Rubber Sundries Division

The Executive Committee of the Rubber Sundries Manufacturers Division held its regular monthly meeting at the Union League Club on the evening of March 20. Concerning the composite list of trade names registered by members it was concluded that each member should inform the association as to the names which should be eliminated and those which should be continued on the register. Consideration was also given to a plan under which members might exchange credit information. However, definite action was withheld so that members may carefully study it prior to the next meeting, when it will be discussed to a conclusion. It was decided to hold at the Yale Club on April 6 a general conference of rubber sundries manufacturers, particularly those producing bathing caps, rubber gloves, sheet goods, rubber balls, balloons, and toys. Nonmembers of the Rubber Association as well as members of the Rubber Sundries Manufacturers Division are to be invited to this conference, which will be devoted to a discussion of problems of mutual interest.

Foreign Trade Division

The Foreign Trade Division met at the Yale Club on March 21 and concluded to reprint several of the more important editions of the educational pamphlet entitled "Why Straight-Side Tires are Better," for distribution in foreign markets. Other important subjects considered were the exclusion of American tires from preferential tariff treatment by Spain; dissemination abroad of educational matter concerning the American rubber industry, and the distribution in Cuba and Porto Rico of the poster which has been prepared concerning common tire abuses.

Tire Executive Committee

The Tire Executive Committee held its regular monthly meeting at the Lotos Club on March 28, when a number of important subjects were considered.

Directors' Meeting

The regular monthly meeting of the Board of Directors was held at the Lotos Club on March 29, when matters of a routine nature were discussed.

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires, Etc.

	Pneumatic Casings				Inner Tubes				Solid Tires			
Month	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
January, 1922	66	4,174,216	2,055,134	1,596,806	66	5,246,647	2,343,393	1,889,724	11	181,769	40,224	33,294
February, 1922	66	4,691,329	2,084,308	1,562,365	65	6,141,956	2,596,774	1,702,583	11	183,448	39,492	36,805
March, 1922	63	5,183,286	2,645,790	2,073,963	63	6,991,118	3,017,511	2,090,737	11	182,197	49,433	48,350
April, 1922	63	5,464,336	2,401,187	2,086,651	65	7,230,096	2,650,573	2,329,343	11	173,748	46,664	52,309
May, 1922	65	5,523,095	2,721,503	2,639,273	65	7,189,552	2,970,696	2,938,947	11	170,904	57,640	60,711
June, 1922	64	5,042,147	2,838,890	3,133,260	64	6,186,534	3,130,629	3,973,679	11	169,808	66,089	63,408
July, 1922	63	4,834,106	2,476,636	2,695,095	63	5,675,839	3,068,199	3,630,744	11	176,375	71,505	60,425
August, 1922	63	4,629,392	2,905,209	3,029,823	63	5,207,228	3,808,224	4,220,055	11	189,698	84,313	69,435
September, 1922	64	4,612,037	2,504,744	2,502,106	64	5,164,757	3,501,442	3,558,971	11	200,016	82,767	66,797
October, 1922	64	4,682,958	2,674,662	2,588,770	64	5,488,033	3,787,758	3,420,680	11	213,942	85,480	71,275
November, 1922	62	4,964,976	2,733,134	2,379,708	61	6,210,053	3,850,908	3,075,023	11	234,684	85,775	61,466
December, 1922	59	4,599,208	2,656,942	2,934,079	59	5,732,125	3,411,074	3,825,949	10	244,061	77,221	64,570
January, 1923	62	4,695,916	3,127,270	2,994,297	62	5,838,310	3,951,885	3,748,651	11	262,462	83,343	60,611

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse branch, or on a consignment basis, or abroad.

Compiled by The Rubber Association of America, Inc.

The Editor's Book Table

Book Reviews

"INDUSTRIAL ORGANIC CHEMISTRY." BY SAMUEL P. SADTLER, Ph.D., LL.D. and Louis J. Matos, Ph.D. Fifth Edition 1923. J. B. Lippincott Co., Philadelphia and London. Cloth, 691 pages, 6 by 9 inches, illustrated and indexed.

THIS is a valuable reference work and as described in its subtitle it is adapted for the use of manufacturers, chemists and all interested in the utilization of organic materials in the industrial arts. The industries enumerated in the table of contents include the following: Mineral oils and allied bitumens, fats and fatty oils, essential oils and resins, sugar, starch and its alteration products, fermentation industries, milk industries, cellulose industries, vegetable textile fibers, textile fibers of animal origin, animal tissues and their products, wood products industries, coal products industries, natural coloring matters, bleaching, dyeing and textile printing. An appendix of useful tables and other data with index concludes the volume.

"SYMBOLIC RUBBER." BY D. F. L. ZORN, CHAIRMAN OF THE Rubber Shareholders' Association of Great Britain. A lecture delivered before the Institution of Rubber Industry in Manchester, England. October 16, 1922.

This is a review of certain philosophic questions and their relation to the whole rubber industry in the light of modern knowledge. The electronic-atomic theory of matter, in which substance is represented as but a form of energy, and the Einstein speculations on relativity, implying that neither space nor time have absolute reality, connoting the probability of another dimension besides length, breadth, and thickness, may all be disconcerting to those wedded to old idols.

Mr. Zorn says that in industry men of large vision are learning to rub out many old notions: For instance, that a bargain must necessarily involve loss to one side; that all trade secrets must be sacredly guarded. Spite, envy, prejudice, and false pride are becoming passé.

The small conferences, he noted, are gradually evolving into larger, broader ones; and just as they have developed the Institution of Rubber Industry, so will the latter help to materialize before long the dream of far-sighted industrialists, a real Rubber Parliament.

"FACTS AFFECTING THE IMPORTATION OF RUBBER PRODUCTS into the Dutch East Indies." Separate monograph prepared by the Rubber Division, Department of Commerce, P. L. Palmerton, chief. Published by Bureau of Foreign and Domestic Commerce, Washington, D. C. Paper, 8 by 9 inches.

The peculiar position of the Dutch East Indies as one of the leading sources of crude rubber supply, and as an importer of rubber goods, is described in this monograph. Exports of rubber to the United States alone averaged 62,000,000 pounds annually from 1919 to 1921. Java and Madura take 90 per cent or more of the imports of manufactured rubber goods for all the Dutch East Indies, and the United States has since 1920 lost much of this trade, due partly to growing competition from Japan, particularly from the Dunlop factory at Kobe, and from renewed French competition.

"EXPORT ADVERTISING." BY DAVID LESLIE BROWN, MANager export advertising department, Goodyear Tire & Rubber Export Co. Published by The Ronald Press Co., New York, N. Y. Cloth 332 pages, 6 by 9 inches.

In this volume, which represents the results of twenty years of advertising and sales experience, the author endeavors to show that export advertising is a paying proposition, and proves his theories by mentioning certain policies which have been found successful, as well as others that can wisely be avoided. In undertaking to set forth the main features of export advertising the author shows his familiarity with his subject, as well as his knowledge of its fundamental principles. The volume is well indexed, and contains a number of forms and charts.

Recent Articles Relating to Rubber

Physics of Rubber, 1920-1921. A summary of developments with synopsis and bibliography covering physical structure and mechanical properties.—W. B. Wiegand, *The Journal of Industrial and Engineering Chemistry*, September, 1922.

Chemistry of Rubber Vulcanization Accelerators. A review of the chemistry and progress in the development of vulcanization accelerators, with many references to original sources.—C. W. Bedford, *The Journal of Industrial and Engineering Chemistry*, September, 1922.

Disubstituted Guanidines. Discussion of their formulæ and reactions, action during vulcanization, and effect of zinc oxide. It requires 25 per cent more diphenylguanidine than di-ortho-tolyl guanidine to produce the same acceleration. Their relative values at lower vulcanization temperatures are shown. Basic zinc carbonate has the same effect as zinc oxide when compounded with disubstituted guanidines.—Winfield Scott, *Industrial and Engineering Chemistry*, March, 1923, 286-290.

The Presence of Quebrachitol and Sugar in Hevea Under Different Circumstances.—W. Spoon, *Archief Rubberculture*, 6, 269-87, 1922.

The Knowledge of the Sugars Present in Hevea Latex.—L. R. Van Dillen, *Archief Rubberculture*, 6, 623-8, 1922.

Individual Differences in the Starch Content of Hevea braziliensis. Individual differences in the starch content of Hevea appeared in the regeneration of the bark and in tapping. When a tree is tapped under such conditions that the flow of latex is prevented, there is only a consumption of bark. In some cases a disappearance of starch could be noted over a great area, but in other cases the starch remained unaltered. The trees yielding best gave a minimal consumption of starch. Therefore, the theory cannot be accepted that there is a direct relation between the disappearance of starch by intense tapping and the formation of rubber.—T. Schweizer, *Archief Rubberculture*, 6, 209-19, 1922.

The Connection Between Starch Content and Tapping Off the Latex. The starch content allows one to judge the state of growth of a tree; with a moderate tapping off the starch content remains unaltered.—T. Schweizer, *Archief Rubberculture*, 6, 327-34, 1922.

Hard Rubber Lined Steel Tanks for Transporting Hydrochloric Acid. Paper by F. C. Zeisberg, presented before the 14th Semi-Annual Meeting of the American Institute of Chemical Engineers, Niagara Falls, Ontario, June 19-21, 1922. Hard rubber lined tanks are necessitated by the classification under the Interstate Commerce Commission Regulations of hydrochloric acid as a dangerous article. The method of lining steel tanks is described, in which a soft rubber is used next the iron and hard rubber over it.—*The Industrial and Engineering Chemistry*, March, 1923.

Confirmatory Tests with Sodium Silico-Fluoride. Tests of samples of crude rubber, prepared with sodium silico-fluoride, in rubber-sulphur mixing, seem to indicate that sodium silico-fluoride slightly retards the rate of cure in proportion to the amount of fluoride used. With litharge compound the figures are very similar.—Henry P. Stevens, *Bulletin of the Rubber Growers' Association*, February, 1923, pages 114-115.

Technology in the Rubber Industry. A paper on this topic by W. A. Williams was read before the Institution of Rubber Industry, February 5, 1922. Success of a technical and scientific department in factory organization depends solely on the staff. The specialist is not so much wanted as a man possessing broad scientific training, with chemistry as his specialty. The factory and laboratory training will make him an efficient works chemist. The organization outlined below meets the requirements of a large plant, but it can be adapted to smaller factories.

The laboratory sections in the full organization are as follows: (a) chemical routine laboratory, (b) physical research laboratory, (c) chemical routine laboratory, (d) physical routine laboratory, (e) mixings control laboratory, (f) experimental laboratory, (g) power, fuel and boilers laboratory, (h) contracts and specifications laboratory, (i) specifications and supplies link, (j) work-planning department.—*Rubber Age*, London, March, 1923, 9-14.

R. G. A. Chemist on Hopkinson Process. A critical study of sprayed rubber by the Hopkinson process, in which some of the points of superiority are questioned. The higher yield obtained by spraying as compared with coagulation is confirmed. It is suggested that part of the increased yield results from the retention substances which coagulation rejects and which are mere diluents and therefore detract from the quality of the rubber. Analysis of the sprayed product as given in the Hopkinson patent indicates abnormal acidity. Tensile strength tests on the vulcanized product from sprayed rubber are reported to yield quite ordinary results. The increased rate of cure is thought to be partly due to traces of ammonia used as preservative. —H. P. Stevens, *The India Rubber Journal*, February 17, 1923, 267-274.

Artificial Latex. A critical review of two recent articles on Water Dispersions from Coagulated Rubber, Balata and Gutta Percha, by John B. Tuttle, The India Rubber World, January and February, 1923.—Henry P. Stevens, *Bulletin of the Rubber Growers' Association*, February, 1923, pages 106-107.

Proofing Fabric with Rubber Latex. Untreated rubber deposited on fabric from latex absorbs moisture quickly and is probably of no practical value as proofing. If, however, the rubber film is soaked in water, so as to remove soluble constituents, and is then re-dried, it is much more resistant to water. Vulcanization of the film, by the aid of an accelerator at 100 degrees, or by the Peachey process, improves the water resistant properties of the untreated film, but not sufficiently for practical application. Vulcanization at higher temperatures renders the film sufficiently resistant, but tenders the fabric.—H. P. Stevens, *Bulletin of the Rubber Growers' Association*, 4, 402-6, 1922.

New Trade Publications

As the result of more than thirty years of designing and manufacturing, The Bristol Co., Waterbury, Connecticut, is now offering a very complete line of recording pressure and vacuum gages, these instruments covering all ranges, from full vacuum to 12,000 pounds pressure per square inch. The company's latest catalog, entitled "Bristol's Recording Gauges for Pressure and Vacuum," is well illustrated, while the great variety of charts listed adapt the gages to practically every application where pressure of liquors, gases, steam, or air are to be measured.

Many of the products of The Seamless Rubber Co., Inc., which include druggists' and physicians' rubber supplies, industrial and sporting goods, toys, hard rubber specialties, etc., are shown in a handsome new catalog, illustrated in color, and entitled "Rubber Goods for Health, Comfort, Convenience and Recreation." Photographs of this company's large and well-equipped plant accompany the catalog.

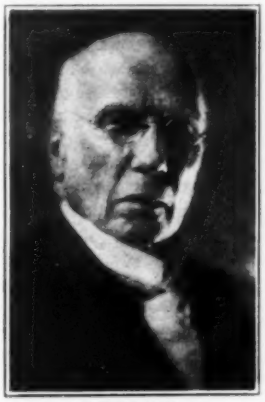
A large and most comprehensive catalog, illustrated in color, sets forth the various types of rubber, leather, and felt footwear manufactured by Ames Holden McCready, Limited, Montreal, Quebec, Canada. Among the many full page photographs included in this catalog are representations of some of the large and well-equipped departments of this important Canadian plant.

An unusually large calender, attractively printed in colors, has been prepared by The Miner Rubber Co., Limited, 1005 McGill Building, Montreal, Canada. On each of the first eleven sheets of the calendar are representations of the company's products, which include a full range of rubber and canvas footwear as well as rubber surface clothing. The twelfth sheet is devoted to a display of some of the company's posters and show card methods of advertising.

The Obituary Record

Long a Leader in the Massachusetts Rubber Industry

Franklin W. Pitcher, for the past twenty years general manager of the Easthampton Rubber Thread Co., Easthampton, Massachusetts, and long president of the Revere Rubber Co., died at his Easthampton home on March 11, after a long illness, aged 89 years.



F. W. Pitcher

Mr. Pitcher was born Christmas day, 1833, in Dover, Maine, and when twelve years old moved to Bangor, where he attended school and worked in stores mornings and evenings. After a few terms in Maine Western Seminary he was a bookkeeper and bank clerk, during which period he bought an interest in a coastwise schooner and thereafter increased his shipholding until the outbreak of the Civil War, when he had shares in twenty-three schooners.

At the age of twenty-four Mr. Pitcher went to Boston Massachusetts, where he engaged in the ship supply and commission, later engaging in the lumber business in Maine, New Brunswick, and finally in Wisconsin.

Returning to Massachusetts in 1882, his connection with the rubber industry began when he became interested in the Boston Elastic Fabrics Co. in Revere, and the Williston Mills, whose plant was sold to the West Boylston Manufacturing Co. When it became necessary to liquidate the Boston Elastic Fabrics Co. the Revere Rubber Co. was formed and so named because of Mr. Pitcher's residence in Revere. He was the first treasurer of the company and afterward its president.

In 1885 members of the Revere Rubber Co. obtained a controlling interest in the Easthampton Rubber Thread Co., and as general manager of this firm Mr. Pitcher became widely known as a specialist in the difficult manufacture of rubber thread. He was also at various times president of the Franklin Steel Works, of Joliet, Illinois, president of the Easthampton Savings Bank, vice-president of the Industrial Mutual Fire Insurance Co., and a director of the Rubber Manufacturers' Mutual Fire Insurance Co., and of the Cotton & Woolen Manufacturers' Mutual Fire Insurance Co.

In 1867 Mr. Pitcher married Miss Mary Frances Stevens, of Pittston, Maine, who survives him, as do a daughter, Mrs. Harry S. Lewis, of Beaver Falls, New York, and two sons, William L. Pitcher, superintendent of the Easthampton Rubber Thread Co., and Walter F. Pitcher, treasurer and general manager of the Franklin Steel Works.

Although not identified with the rubber industry until his forty-ninth year, he quickly became an important factor in it and devoted nearly four active decades to the conduct of a highly successful and prosperous business. Ever optimistic, genial, big-hearted and whole-souled, he goes to his richly earned reward beloved by all who knew him.

Veteran Rubber Chemist and Engineer

John Butcher, oldest retired employe of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, died on February 12, in his seventy-fourth year.

He was born in Hightstown, New Jersey, in 1849, and went to work for the Boston Woven Hose & Rubber Co. in 1880 under Robert Cowan, then superintendent. From that time he rounded out forty-one years of service until in 1921, in consequence of a fall and failing health, he was forced to retire on a pension.

From an assistant to Mr. Cowan he rose to many positions of responsibility. The last twenty years of his connection with the company were spent in experimental work and the development of new process formulæ. It was by his careful and studious direction in this work that he proved to be an exceedingly valuable factor in the manufacturing of some of the firm's best known products.

He is survived by his widow, three sons, and three daughters. Burial was at Woodlawn Cemetery.

A Prominent Rubber Executive

J. C. Matlack, who was well known in the rubber and automotive industries, died on February 19 at Long Key, Florida, while on a fishing trip.

J. C. Matlack

Born at Monticello, Illinois, and educated in the public schools of St. Louis, Missouri, he was first employed as driver of a dynamite wagon for the Hercules Powder Co. there, later advancing to salesman. On leaving that concern he was employed by the E. C. Meecham Arms Co., sporting goods manufacturers, soon starting in the bicycle business with the Simmons Hardware Co., and rising to manager of the bicycle, accessories, and sewing machine departments. Later he became eastern sales manager for A. Featherstone & Co., bicycle manufacturers. When the American Bicycle Co. was organized he was made purchasing agent for its more than sixty factories, becoming western sales manager in 1901.

The following year he resigned to become president of the International Automobile & Vehicle Tire Co., Milltown, New Jersey, and when that company was succeeded by the Michelin Tire Co., in 1907, he was made vice-president and general manager. In 1911 he left the Michelin company and for a time was closely allied with W. C. Durant in the early organization and development of the General Motors Co., after which he connected himself with the newly organized Ajax-Grieb Rubber Co. as secretary and general manager. Under his able management for six years, the value of the business was multiplied many times.

In 1917 he resigned to become vice-president of the American Writing Paper Co., Holyoke, Massachusetts, but later that year returned to the rubber industry as president and general manager of the Globe Rubber Tire Manufacturing Co., Trenton, New Jersey. During the war he did valuable work for the government as a member of the Rubber and Rubber Goods Section of the War Industries Board. His latest rubber connection was as vice-president in charge of sales of the Madison Tire & Rubber Co., New York, N. Y.

Mr. Matlack was a man well known in rubber and automobile circles, of pleasing personality, vigorous initiative, and exceptional organizing ability. His acquaintance among Masonic bodies was also extensive. He is survived by his widow, Mary E. Matlack,

his daughter, Mrs. G. Charles McCullough, and his sister, Mrs. J. R. Perry. The funeral was held in St. Louis, Missouri, on February 24.

President of Paramount Rubber Consolidated, Inc.

Lee Harrar Heist, president of Paramount Rubber Consolidated, Inc., Little Falls, New Jersey, whose death on February 1, 1923, was noted in the March issue of The India Rubber World, was born at Harrisburg, Pennsylvania, June 19, 1882, and was educated at Mercersburg College and Cornell University.

Lee H. Heist

His first business connection was with Manning, Maxwell & Moore Co., Philadelphia, Pennsylvania, following which he went to the Blaisdell Pencil Co., also of Philadelphia, as treasurer. He was vice-president and treasurer of Paramount Rubber Consolidated, Inc., until 1921, when he was elected president and served until his untimely death.

Mr. Heist belonged to various Masonic bodies, was past president of the Rotary Club, and a member of the Manufacturers' Club and Cricket Club, all of Philadelphia, Pennsylvania, where he resided.

Former Executive of Manhattan Rubber Co.

Executives of The Manhattan Rubber Manufacturing Co., Passaic, New Jersey, report with deep regret the death, on March 5, 1923, of Burton S. Gibbs, for many years the general western agent of their company, and at one time secretary and director. Mr. Gibbs, who was fifty-four years of age, had been in ill health for some months, and died from a stroke of apoplexy at his home in San Francisco, California. He is survived by his wife and two sisters, Mrs. Charles E. Walker, of Hartford, Connecticut, and Mrs. Wellenden, of Boston, Massachusetts.

Former New Jersey Rubber Man

Edward R. Solliday, one of the founders of the New Jersey Rubber Co., Lambertville, New Jersey, died recently at his home in Trenton, aged 81 years. Thirty-three years ago he organized the New Jersey concern with some business associates and began operations. Some years later the company was purchased by the Clapps, of Boston, Massachusetts. After disposing of his interests in the rubber factory Mr. Solliday became claim agent for the Pennsylvania Railroad and a few years ago was placed on the pension list.

Former Cement Manufacturer

Captain James T. Stevens, founder of the Braintree Rubber Cement Co., died on March 16 after a brief illness. He was in his eighty-eighth year.

Following his education in the Hollis Institute at South Braintree, he learned the tack maker's trade and later organized the tack manufacturing business of James T. Stevens & Co. From this he withdrew in 1908 and founded the Braintree Rubber Cement Co., which he subsequently sold.

Captain Stevens was one of the most prominent men in Braintree. During the Civil War he served in the army, at various times represented his town in both branches of the Massachusetts Legislature, and for thirty-eight years, twenty-eight years a chairman of the board, he was one of the water commissioners of Braintree. He was a trustee of the Braintree Savings Bank and president of the Braintree Cooperative Bank. He belonged to various Masonic bodies, was a member of the South Methodist Episcopal church and of the Old Stoughton Musical Society.

He is survived by his widow, a son and a daughter.

Crossing the Sahara Desert by Automobile

One of the most astonishing and romantic of modern engineering feats is the crossing of the "impenetrable" Sahara Desert by means of caterpillar trucks. The expedition which performed this seemingly impossible task was financed by M. André Citroen, the French automobile manufacturer. The party consisted of eight persons—M. Hardt, director of the Citroen works; M. Dubreuil, a representative of the Air Ministry; a photographer; a scientific observer; and four mechanics. The transport consisted of four standard 10-horsepower cars such as are produced by the Citroen company.

The special feature of the equipment was a flexible-ribbed Kegresse-Hinstin attachment of canvas and rubber which replaced the rear wheels, the front wheels differing little from the ordinary type. On each side of the cars were two spoked wheels of average diameter and four diminutive disk wheels, the important feature of the mechanism being that the weight is evenly distributed on the elongated "tires," or thick tough belts built of rubber and fabric, which possess great flexibility. By means of this device tractive and cushioning effects as well as non-puncturability were secured and the expedition returned safely from its journey to Timbuktu on January 10, having covered nearly two thousand miles in twenty-one days.

Citroen tractors have recently been successful also in scaling the Pyrenees in the middle of winter, while from Palestine now comes news of a project for establishing a motor vehicle service which will cross the Syrian Desert, connecting Amman and Baghdad. In this undertaking a special chain track equipment will also be utilized for commercial cars, passenger cars being fitted with pneumatics. Truly the automobile and rubber industries are robbing the desert of its terrors.

Citroen Truck Equipped with Rubber "Caterpillar" Tires

CHARLES GOODYEAR HONORED

At the spring meeting of the American Chemical Society at New Haven, Connecticut, a tablet will be erected by the Rubber Division in memory of Charles Goodyear. The entire program on this occasion will be commemorative of the work of this great inventor. Dr. Bruni, of Milan, Italy, plans to be present and has prepared a paper on his late researches on the acceleration of vulcanization.

The manufacture of rubber goods is now being carried on by S. A. Womell of Rio de Janeiro. Among the products turned out by this plant are rubber soles and heels, rubber sheets, and a non-stretching rubber belting for transmission purposes.

Annual Report of the United States Rubber Co.

THE fourteenth annual report of the United States Rubber Co. for the year ended December 31, 1922, indicates that the firm has decisively turned the corner and is again well on the road to profitable operations.

Sales for the year amounted to $168,786,350, against $164,706,621 in 1921 and $256,150,130 for the record year 1920. Net income for the year, after deducting $4,970,072 for interest on funded indebtedness and all other charges, was $7,692,039, against $492,811 for 1921. Dividends on preferred stock amounting to $5,538,718, left a surplus for the year of $2,153,321, or $2.65 a share earned for the common, against 68 cents a share the preceding year. Total surplus as of December 31, 1922, was $32,097,821, against $30,048,439 at the end of 1921.

The relation of current assets to current liabilities is now better than three to one. Bank loans were reduced $11,130,000 during the year. The company retired $970,000 of funded indebtedness and substituted 5 per cent long-term bonds for $6,000,000 7 per cent short term notes which were retired.

On January 15, 1923, there were 19,225 preferred stockholders and 14,799 common stockholders, making a total of 34,024 holders of United States Rubber Co.'s stock.

The annual report follows:

The Chairman's Report

The following is a report of the operations of the company for the year ended December 31, 1922, and of the position of the company as of the close of the year.

Operations for the Year 1922

Sales for the year amounted to $168,786,350, being an increase of $4,079,729 compared with the sales for 1921. Because of the lower range of selling prices comparison of dollar volume of sales with previous years is not fairly indicative. Considered on a basis of tonnage or units, the volume of business for the year 1922 was substantially in excess of that for 1921 in all principal products, especially in tires and mechanical goods.

Net profits from operations for the year amounted to $12,662,111. It was found necessary to make several reductions in the selling prices of tires from those in effect as of January 1, 1922, which were already too low as compared with the cost of production. This materially affected the results for 1922. Interest on funded indebtedness amounted to $4,970,072, leaving net income for the year of $7,692,039, after all interest and other charges. This compares with net income of $492,811 for the year 1921.

Dividends on the preferred stock for the year amounted to $5,538,718, leaving surplus for the year of $2,153,321. The consolidated surplus as of December 31, 1922, amounted to $32,097,821.

Current assets as of December 31, 1922, amounted to $120,627,062, and current liabilities amounted to $39,144,305.

Bank loans were reduced $11,130,000 during the year. Accounts payable and accrued liabilities increased $1,723,349 as compared with the first of the year, principally in connection with acceptances payable for importation of crude rubber.

Inventories and Contractual Liabilities

Inventories of finished goods were taken at cost of production, which represents sound values. These inventories could not be replaced at these values, with raw materials at the prevailing market prices. Approximately two-thirds of the finished goods were located at the company's sales branches.

Inventories of raw materials and supplies were taken at cost prices, which in practically all cases, especially crude rubber, were materially below market prices, and in no case higher than market prices.

Contractual liabilities as of December 31, 1922, representing forward commitments for raw materials and supplies, amounted to approximately $10,000,000, all of which were at prices below current market, and as to quantities covered future requirements for conservative periods.

Retirement of Notes and Funded Indebtedness

On December 1, 1922, the company retired $6,000,000 of 7 per cent secured gold notes, due December 1, 1923, being all of said issue. This released $9,000,000 of the company's 5 per cent first and refunding mortgage gold bonds, due January 1, 1947, which had been deposited as security for the notes. $7,000,000 of the 5 per cent bonds so released were sold to provide funds for the retirement of the 7 per cent notes, and the remaining bonds, amounting to $2,000,000, are held in the treasury. The company had an opportunity to sell the 5 per cent bonds at a favorable price, and, while the 7 per cent notes would not have matured for another full year, it was considered advisable to take advantage of this opportunity to sell the bonds and thus substitute long-term bonds for the short-term notes.

The company retired $970,000 of funded indebtedness during the year, through the operation of the sinking funds, being $790,000 of 5 per cent bonds and $180,000 of 7½ per cent notes.

The total outstanding funded indebtedness as of December 31, 1922, after giving effect to the foregoing transactions, amounted to $85,981,800, a net increase of $30,000 as compared with the first of the year, against which, however, a saving of $123,000 was effected in the annual interest charges. A statement of the funded indebtedness is given herewith.

Rubber Plantations

The development of rubber plantations owned by the company has progressed satisfactorily. The properties are located in Sumatra and on the Malayan Peninsula. Those in Sumatra comprise a total of 88,659 acres, of which 48,917 acres have been planted and about 43,600 acres of the planted areas are in production. Those on the Malayan Peninsula comprise 22,226 acres, of which 10,311 acres have been planted, with about 1,500 acres in bearing.

The ownership of these plantations enables the company to obtain from its own properties a constantly increasing supply of crude rubber, and what is of even greater importance, to obtain rubber of uniform quality, especially adapted to its own requirements.

The rubber produced on these plantations is taken over by the United States Rubber Co. at current market prices, and enters into its manufacturing costs at these prices. On this basis the plantations have produced a profit, except for a period of extreme low prices during 1922, and the plantation companies have accumulated a surplus after providing conservative reserves for amortization of the cost of the properties. No part of the profits or surplus has been included in the results of the United States Rubber Co.

The company closed the year in a strong financial condition, as indicated by the balance sheet, and as to inventories of finished goods and raw materials, including forward commitments, is in a favorable position. The business outlook for 1923 is encouraging.

C. B. SEGER, Chairman.

Consolidated General Balance Sheet—Dec. 31, 1922

United States Rubber Co. and Subsidiary Companies

Assets

Cash	$12,104,575.39	
Accounts and notes receivable from customers	42,416,646.01	
Accounts, notes and loans receivable, others	2,439,706.36	
Finished goods	40,628,274.18	
Materials and supplies, including goods in process	23,037,860.40	
Total current assets		$120,627,062.34
Notes receivable of employes given for purchase of common stock and secured by such stock	$6,881,465.18	
Common stock of U. S. R. Co. held under service contracts and agreements	2,305,336.49	
Securities owned, including common stock of U. S. R. Co. held by a subsidiary company	5,763,659.91	
Plants, properties and investments, including rubber plantations, less reserve for depreciation	176,626,685.39	
Prepaid and deferred assets	4,106,812.28	195,683,959.25
Total assets		$316,311,021.59

Liabilities, Reserves and Capital

Bank Loans	$25,080,000.00	
Accounts payable, including acceptances payable for importation of crude rubber	14,064,305.33	
Total current liabilities		39,144,305.33
Funded indebtedness		85,981,800.00
Total liabilities		$125,126,105.33
Reserves for insurance	$2,964,352.74	
General reserves	1,649,666.95	
Reserve for dividend on preferred stock, payable January 31, 1923	1,380,000.00	
Total reserves		5,994,019.69
Capital stock—preferred $69,000,000.00		
Less amount paid by subsidiary company	3,890,000.00	$65,110,000.00
Capital stock—common		81,000,000.00
Minority—Canadian Consolidated Rubber Co., Limited, stock		273,800.00
Total capital stock		$146,383,800.00
Fixed surpluses—subsidiary companies		6,709,275.22
Surplus (subject to final determination of Federal taxes for years subsequent to 1917)		32,097,821.35
Total capital stock and surpluses		185,190,896.57
Total liabilities, reserves and capital		$316,311,021.59

Statement of Funded Indebtedness

First and refunding mortgage 5 per cent gold bonds, Series A, due 1947—issued	$69,000,000.00	
Less amount retired through sinking fund	3,238,200.00	
	$65,761,800.00	
Less amount held in treasury	2,000,000.00	63,761,800.00
Ten year 7½ per cent secured gold notes, due August 1, 1930 (security as stated below)	$20,000,000.00	
Less amount retired in connection with sinking fund operations	380,000.00	19,620,000.00
Canadian Consolidated Rubber Co., Limited, 6 per cent gold bonds, due 1946		2,600,000.00
Total funded indebtedness outstanding, as per balance sheet		$85,981,800.00
Treasury bonds deposited as security for ten year 7½ per cent secured gold notes, as stated above:		
First and refunding mortgage 6 per cent gold bonds, Series B, due 1947	$24,525,000.00	

Statement of Surplus Account

Surplus December 31, 1921		$30,048,439.27
Net profits from operations for the year 1922	$12,662,110.81	
Interest on funded indebtedness	4,970,071.97	
Net income for the year, after all interest and other charges	$7,692,038.84	
Dividends on the preferred stock, including accrual of dividend payable January 31, 1923	$5,520,000.00	
Dividends on minority stock of Canadian Consolidated Rubber Co., Limited	18,718.00	5,538,718.00
Surplus for the year		2,153,320.84
		$32,201,760.11
Sundry charges, less credits, to surplus, in adjustment of transactions of prior periods, etc.		103,938.76
Surplus December 31, 1922		$32,097,821.35

Fisk Rubber Co.

Sales of the Fisk Rubber Co. for the year 1922 were $45,462,441, over 13 per cent in excess of those for 1921, which totaled $39,269,323. Unit sales for the same period increased approximately 50 per cent. Net profit for the year after depreciation, but before interest and other charges, amounted to $3,202,467, and after interest and charges to $1,655,075, which was added to surplus. This means some $260,000 available for the common, after first and second preferred dividends, or about 34½ cents a share on the 754,659 shares issued. The balance sheet, as of December 31, 1922, follows:

Assets

CAPITAL ASSETS:			
Land, buildings, machinery and equipment, December 31, 1921		$21,030,133.46	
Additions for the year ending December 31, 1922		1,296,629.71	
		22,326,763.17	
Goodwill		1.00	$22,326,764.17
INVESTMENTS:			
Investments in and advances to affiliated companies		3,175,377.92	
Miscellaneous investments		752,838.01	3,928,215.93
TREASURY STOCK:			
1,984 shares of common stock acquired by cancellation of employes subscription contracts and held either for sale or re-allocation			49,354.75
CURRENT ASSETS:			
Inventories—			
Rubber and fabric	$2,238,525.64		
Materials and supplies	1,735,875.97		
Work in process	872,310.83		
Finished stock	8,674,078.31	13,520,790.75	
Accounts receivable, less reserves—			
Trade	7,637,784.33		
Others	221,675.03	7,859,459.36	
Notes receivable—			
Trade	611,730.04		
Others	610,907.13	1,222,637.17	
Cash in banks, on hand and in transit		2,495,733.18	25,098,620.46
DEFERRED CHARGES TO OPERATIONS INCLUDING REFINANCING EXPENSES OF NEW BOND ISSUE			1,564,710.68
			$52,967,665.99

Liabilities

CAPITAL STOCK:		
7 per cent cumulative first preferred—		
Authorized—250,000 shares, par $100	$25,000,000.00	
Issued—193,240 shares	19,324,000.00	
Less—5,000 shares held for retirement	500,000.00	
	18,824,000.00	
Reserved for issue for a corresponding amount first preferred stock of the Federal Rubber Co., 1,275 shares	127,500.00	$18,951,500.00
Management stock—authorized and issued		15,000.00
7 per cent cumulative second preferred—		
Authorized—100,000 shares, par $100	10,000,000.00	
Issued—10,921 shares	1,092,100.00	
Reserved for issue for a corresponding amount second preferred stock of the Federal Rubber Co., 10,286 shares	1,028,600.00	2,120,700.00
Common—		
Authorized—1,250,000 shares, no par value.		
Issued—754,659 shares		6,501,445.01
(Of the above 754,659 shares, 50,000 are held in escrow under option for $250,000.00)		
		27,588,645.01
FIRST MORTGAGE 20-YEAR SINKING FUND GOLD BONDS:		
Due September 1, 1941	10,000,000.00	
Less—bonds retired	500,000.00	9,500,000.00
PURCHASE CONTRACT—PAWTUCKET PLANT	764,800.00	
Less—cash deposited with trustee	764,800.00	
CURRENT LIABILITIES:		
Loans payable	5,135,000.00	
Accounts payable	1,761,578.64	
Accrued bond interest	253,333.34	7,149,911.98
RESERVES:		
For depreciation	4,711,526.60	
For insurance liability assumed by company	120,000.00	
For contingencies	369,088.87	5,200,615.47
SURPLUS—per statement annexed		3,528,493.53
		$52,967,665.99

News of the American Rubber Trade

Financial

Dividends Declared

COMPANY	STOCK	RATE	PAYABLE	STOCK OF RECORD
Allis-Chalmers Mfg. Co.	Pfd.	$1.75 q.	Apr. 16	Mar. 24
Bliss, E. W., Co.	Com.	$0.25 q.	Apr. 2	Mar. 19
Bliss, E. W., Co.	1st Pfd.	$1.00 q.	Apr. 2	Mar. 19
Bliss, E. W., Co.	"B" Pfd.	$0.15 q.	Apr. 2	Mar. 19
Brunswick-Balke-Collender Co.	Pfd.	1¾%	Apr. 1	Mar. 21
Canadian Consol. Rubber Co.	Pfd.	1¾% q.	Mar. 31	Mar. 24
Firestone Tire & Rubber Co.	6% Pfd.	1½% q.	Apr. 15	Apr. 1
General Tire & Rubber Co.	Pfd.	1¾% q.	Apr. 1	Mar. 20
Goodyear Tire & Rubber Co.	Pfd.	$2.00 q.	Apr. 1	Mar. 20
Goodyear Tire & Rubber Co.	Pfd. v.t.c.	$2.00 q.	Apr. 1	Mar. 20
Goodyear Tire of Canada	Pfd.	$1.75 q.	Apr. 2	Mar. 17
Hood Rubber Co.	Com.	$1.00 q.	Mar. 31	Mar. 20
India Tire & Rubber Co.	Pfd.	1¾%	Apr. 2	.....
India Tire & Rubber Co.	Com.	1%	Apr. 2	.....
Kelly-Springfield Tire Co.	6% Pfd.	$1.50	Apr. 2	Mar. 16
Penna. Rubber Co.	Com.	1½% q.	Mar. 31	Mar. 15
Penna. Rubber Co.	Pfd.	1¾% q.	Mar. 31	Mar. 15
United Shoe Machinery Corp.	Com.	$0.50 q.	Apr. 5	Mar. 20
United Shoe Machinery Corp.	Pfd.	1½% q.	Apr. 5	Mar. 20
Westinghouse Elec. & Mfg. Co.	Com.	$1.00 q.	Apr. 30	Mar. 30
Westinghouse Elec. & Mfg. Co.	Pfd.	$1.00 q.	Apr. 16	Mar. 30

New York Stock Exchange Quotations

March 26, 1923

	High	Low	Last
Fisk com.	14½	14⅛	14⅛
Goodrich com.	39¼	38	38¼
Goodyear pfd.	96⅝	96⅝	96⅝
Kelly-Springfield com.	60⅝	57	57⅜
Lee com.	30⅜	30⅛	30⅛
United States Rubber com.	63	61¼	61¼
United States Rubber pfd.	104	103¼	103¼

Akron Rubber Stock Quotations

Quotations of March 24 supplied by App-Hillman Co., Akron, Ohio, were as follows:

	Last Sale	Bid	Asked
American com.	10	...	8
American pfd.	50	...	50
Amazon com.	2	2½	3½
Firestone com.	84	82	85
Firestone 6% pfd.	97	97	98
Firestone 7% pfd.	97	97	98
General com.	178	...	180
General 7% pfd.	99½	97½	...
Goodrich 6½s.	100	100	100½
Goodyear com.	15½	15⅜	15⅝
Goodyear 7% pfd.	50	50	50¾
Goodyear 1st mtg. 8's	117½	116	117½
Goodyear deb. 8's	103¾	103½	104
India com.	95	92	97
India 7% pfd.	90	90	95
Mason com.	5⅞	5¾	6½
Mason 7% pfd.	44	44	46
Marathon	2½	2	3
Miller com.	101	101	...
Miller 8% pfd.	104	103½	...
Mohawk com.	17	16	20
Mohawk 7% pfd.	70	67	70
Rubber Products	20	18	23
Seiberling com.	10	9¼	10
Seiberling 8% pfd.	68	65	70
Star com.	25	25	30
Star 8% pfd.	80	...	...

Meeting of Waste Material Dealers

The tenth annual meeting and banquet of the National Association of Waste Material Dealers was held at the Hotel Astor, New York, March 21, 1923. Harry R. De Groat, of A. M. Wood & Co., Inc., Philadelphia, Pennsylvania, was unanimously elected president of the association for the ensuing year.

At the meeting of the Scrap Rubber Division Nat. E. Berzen was reelected chairman for the coming year. No other business of importance was brought before the meeting although there was a general discussion on the lax observance of trade customs in force by rubber reclaimers.

Advance in Tire Prices

Following the recent announcement by The United States Rubber Co. of a 10 per cent advance, effective March 15, in its tire prices, other similar organizations have since been falling into line. A 10 per cent increase was reported a few days later by The Goodyear Tire & Rubber Co., The B. F. Goodrich Co., and the Miller Rubber Co., all of Akron, Ohio, while a similar announcement was expected from The Firestone Tire & Rubber Co., The Kelly-Springfield Tire Co., and possibly The Ajax Rubber Co. A 10 per cent advance in its prices was also made by The Hood Rubber Co., Watertown, Massachusetts, and increases of approximately 10 per cent by The Hewitt Rubber Co., Buffalo, New York, and The Fisk Rubber Co., Chicopee Falls, Massachusetts. Still later The Murray Rubber Co., Trenton, New Jersey, announced an increase, effective April 1, of 15 per cent on its tires and tubes, while tire prices for The Globe Rubber Tire Manufacturing Company were advanced on March 15 10 and 15 per cent. A rise of 10 and 12½ per cent on its tires and tubes was also announced by The Bergougnan Rubber Company. Two other Trenton concerns, The Acme Rubber Manufacturing Company and The Thermoid Rubber Company, may increase tire prices in a few weeks time. It is understood that the advance in general applies to both tires and tubes, while the new prices are said to be necessitated by the recent rise in cotton fabric and crude rubber prices.

New Incorporations

Akron Acid Proof Apron Co., The, January 26 (Ohio), $50,000. J. McIntosh; M. De Forest; E. Philfott; H. Pickett; W. H. White. Principal office, Akron, Ohio. To manufacture rubber aprons and other rubber supplies.

Akron Rubber Washboard Co., March 5 (Ohio), $10,000. A. Bleeker; W. A. and E. I. Schraegle; F. H. Lohrmer. Principal office, Akron, Ohio. To manufacture rubber washboards and other rubber articles.

Akron Trading Co., The, January 20 (Ohio), $50,000. N. S. Noble; P. Davis; A. N. Burnett; R. E. Frazer. Principal office, Akron, Ohio. To deal in rubber.

Buckeye Rubber Manufacturing Co., The February 26 (Ohio, 60,000 shares; no par value. H. H. Burton; C. J. Smith; J. J. Laughlin, Jr.; T. H. Westlake; M. E. Mullin, all of Cleveland, Ohio. Principal office, Willoughby, Ohio. To manufacture rubber products.

Canton Tire Service Co., February 28 (Ohio), $10,000. E. F. Cockley; C. E. Tritt; E. E. Schuster; L. W. Rogers. Principal office, 537 Cleveland avenue, N. W., Canton, Ohio. To deal in tires and tubes.

Federated Rubber Company of New York, Inc., March 20 (New York), $10,000. A. G. McDonough, 454 Forty-fifth street, Brooklyn, New York; M. J. Grant, 141 West 117th street; F. Laviscount, 240 West 61st street, both of New York City. To manufacture rubber goods.

General Automobile Co., The, February 7 (Ohio), $10,000. R. and E. M. Smith; C. M. Chapman; M. A. Schauer; G. Wilhelm. Principal office, Akron, Ohio. To deal in tires, tubes and accessories.

H. & C. Tube and Tire Co., The, March 15 (Delaware), $750,000. T. L. Croteau; M. A. Bruce; A. M. Hooven, all of Wilmington, Delaware. Delaware agent, Corporation Trust Company of America, DuPont Building, Wilmington, Delaware. To manufacture and sell tires, tubes and other articles manufactured from rubber.

Harlem Truck Tire Corporation, March 20 (New York), $3,000. B. Schloer; A. Fester; T. Fisher, all of 360 East 136th street, Bronx, New York City. To deal in tires and accessories.

Hygienic Rubber Manufacturing Co., Inc., February 24 (New York), $5,000. J. H. Aldred, president; A. C. Aldred, secretary, both of 19 Hadley avenue, Clifton, New Jersey; J. Pastore, treasurer, 2668 East 12th street, Brooklyn, New York. Principal office, 429 Broome street, New York City. To manufacture rubber novelties and sanitary articles.

Jackson Tire Co., Inc., March 17 (New York), $1,000. C. S. Lubin, 100 West 118th street, New York City; C. Segal, 5107 Eleventh avenue; F. Klein, 761 Prospect Place, both of Brooklyn, N. Y. Principal office, Brooklyn, New York. To deal in tires.

Jordan Tire Co., The, January 26 (Ohio), $10,000. J. A. Elden; A. M. Jordan; W. V. Peters; G. H. Field; W. Bradfield. Principal office, 2430 Euclid avenue, Cleveland, Ohio. To manufacture and deal in tires and tubes.

King Tire & Rubber Co., The, February 19 (Delaware), $1,500,000. T. L. Croteau; M. A. Bruce; A. M. Hooven; S. E. Dill; F. R. Bogart, all of Wilmington, Delaware. Delaware agent, Corporation Trust Company of America, DuPont Building, Wilmington, Delaware. To manufacture and deal in tires for automobiles, bicycles, carriages and vehicles of all kinds and description, made of rubber, metal or any other material.

McGee Rubber Heel Co., James, The, January 26 (Ohio), $50,000. J. McGee; J. Dolan, J. E. Smith; J. P. Murphy. Principal office, 36½ West Main street, Newark, Ohio. To manufacture rubber heels.

Miami Rubber Co., The, February 15 (Ohio), $60,000. J. E. Meloney; J. G. Fosset; L. T. Murphy; F. E. Gallagher; S. Sheyman. Principal office, Cincinnati, Ohio. To manufacture and deal in tires and tubes.

Millbury Rubber Corporation, February 28 (Delaware), $300,000. M. M. Lucey; M. B. Reese; L. S. Dorsey, all of Wilmington, Delaware. To manufacture and deal in tires, tubes and accessories.

Miller Rubber Export Co., Ltd., The, March 5 (Delaware), $50,000. J. Pfeiffer, 105 Mayfield avenue; W. F. Pfeiffer, 1131 Oakdale avenue; F. C. Millhoff, 163 Oakdale avenue, all of Akron, Ohio. Delaware agent, Leonard E. Wales, 901 Market street, Wilmington, Delaware. Principal office, Bloomington, Delaware. To manufacture and deal in merchandise composed of gutta-percha, caoutchouc, and similar products.

Northern Metal Co., Inc., February 22 (Delaware), $75,000. A. Tabas, 4706 North 8th street; R. L. Cobb, 1715 Diamond street; C. H. Werner, 1632 Glenwood avenue, all of Philadelphia, Pennsylvania. Delaware agent, United States Corporation Co., Dover, Delaware. To buy, sell and deal in rubber, rags, metals and all other second hand or waste materials.

Overshoe Tire Co., Inc., March 5 (New York), $100,000. J. F. Mumm; K. Scheidt; P. L. English, all of Buffalo, New York. Principal office, Buffalo, New York. To manufacture automobile tires.

Royal Tire & Auto Service Co., The, February 23 (Ohio), 250 shares no par value. J. H. Smart; C. B. Ford; L. J. Ford; D. M. Connor. Principal office, Cleveland, Ohio. To deal in tires.

Southern Tire Selling Co., Inc., March 1 (New Jersey), $100,000. A. H. Cubberley, president; J. A. Sands, vice president; E. W. Wiggins, secretary and treasurer. Principal office, 150 Nassau street, New York City. To buy and sell tires through branches.

Tiffany Corporation, David H., March 15 (New York), $50,000. D. H. and H. R. Tiffany; G. A. Fritsche, all of Rochester, New York. Principal office, Rochester, New York. To manufacture automobile tires.

Vogue Tire Company of New York, Inc., March 14 (New York), $100,000. H. P. Rycroft; G. J. Peppard, both of 126 West 64th street; L. Sturcke, 52 Broadway, all of New York City. To deal in tires and tubes.

The Rubber Trade in the East and South

Manufactured Goods

The leading divisions of the rubber manufacturing industry are well supplied with orders covering spring deliveries and are therefore operating at practically full capacity.

Leading tire companies have made the usual spring advance in their tire manufacturing schedules to figures approaching capacity.

In mechanical lines trade is brisk both East and West. Demand for rubber goods used in railway and transportation service as well as for industrial purposes is evident in increasing volume. Heel production continues at a high level and is practically coextensive with the demand for leather footwear. Rubber heels are rapidly becoming standard shoe equipment on new goods as well as for repair.

Footwear and weatherproof clothing are in seasonal production of goods for spring and summer consumption. Insulated wire companies are very active, and behind on their orders. The complaint of rubber manufacturers generally is not of lack of business but of the closeness of competition, which leaves them an extremely unsatisfactory margin for profit.

Hodgman Establishes Main Office in New York

The Hodgman Rubber Co. has again established its main office in New York City, by the removal on March 26 of its executive offices and sales departments to the new National Association Building, 25 West 43rd street.

Comparatively few changes in location have been made by this well known concern since its establishment by Daniel Hodgman, in 1838, at 27 Maiden Lane, corner of Nassau street, where the business was carried on for a period of 41 years.

From 1883 to 1898 the company's wholesale and main offices were located at the corner of Broadway and Grand street, while a retail store was maintained at 21 West 23rd street. In 1898 the main offices were removed to 593 Broadway, and again, in 1903, to 806-808 Broadway, corner 11th street.

Since 1915 the main offices have been located at the company's plant at Tuckahoe, New York, although a sample room and city office has been maintained at 8 West 40th street. This organization has had a long and eventful history.

New York

The New York offices of Underwriters' Laboratories are now at 109-111 Leonard street, where will be continued the work of this organization's electrical testing laboratory and the conduct of inspections at factories and label service in the metropolitan district, New York State, New Jersey, and southern Connecticut.

The United States Rubber Reclaiming Co., Inc., formerly at 20 West 60th street, has removed its offices to 342 Madison avenue, New York, N. Y.

After May 1, the Baird Rubber & Trading Co., Inc., now at 9-15 Murray street, will occupy Rooms 2536-2540 in the Woolworth Building, 233 Broadway, New York, N. Y.

C. M. White, Jr., 602 Flatiron Building, Akron, Ohio, is representing E. L. Bullock & Sons, Inc. of 99 John street New York, N. Y.

William H. Stiles & Co., crude rubber importers and merchants, announce the removal of their offices to the Kerr Building, 44 Beaver street, New York, N. Y.

The General Tire & Rubber Co., Akron, Ohio, has recently appointed Robert A. White as its commercial account representative, with headquarters in New York City.

Alfred B. Jones has recently resigned both as president and director of The Kelly-Springfield Tire Co., 250 West 57th street, New York, N. Y.

The annual house gathering of the employes of the Morse Chain Co., Ithaca, New York, was held under the auspices of the Morse Industries Association, March 2, at the company's club house.

The varied entertainment was thoroughly enjoyed by the operatives, who attended 1,600 strong. One of the concluding features was an address by Frank L. Morse, president of the company, who reviewed the history and development of this organization, which, from small beginnings, is now representative of one of the country's important industries.

The Lowenthal Co., Chicago, Illinois, dealer in scrap rubber, has reopened its New York office at 350 Madison avenue. R. D. Ottignon, formerly with Nat E. Berzen, is in charge.

The Buffalo Foundry & Machine Co., Buffalo, New York, manufacturer of "Buflovak" and "Buflokast" evaporators and chemical equipment, reports the following changes in its executive personnel: C. W. Pearson becomes vice-president and treasurer, continuing, however, to discharge his duties as director of sales, while P. J. Krentz, formerly works manager, and who has also been recently elected vice-president, will remain actively in charge of manufacture and production. Both officials have been connected with the company almost from its organization.

E. H. Kidder, long New England sales manager of the United States Tire Co., with headquarters in Boston, has resigned to become vice-president in charge of sales of The Dunlop Tire & Rubber Corporation of America, Buffalo, New York, a position for which he is unusually well fitted. Prior to his departure he was banqueted by his associates at the Copley-Plaza hotel and presented with a gold watch and chain as a token of their esteem. It is understood that the Dunlop factory will soon be producing 2,000 tires daily, and that the output will be increased as rapidly as its sales organization can be spread over the United States and Canada.

The Achilles Rubber & Tire Co., Inc., Binghamton, New York, manufacturer of automobile tires and tubes, reports an encouraging outlook for the future, with many unfilled orders and no difficulty experienced in disposing of its products. Executives of this company include Harry J. Smith, president and general manager; Ashton W. Caney, vice-president and sales manager; and George L. O'Neil, secretary and treasurer.

Pennsylvania

A two-story building, to be used as a garage and service room, is the latest addition to the plant equipment of The Quaker City Rubber Co., 624-628 Market street, Philadelphia, Pennsylvania. "Quaker" tires and various mechanical rubber goods, including a special type of packing, are manufactured by this company.

New managers recently appointed by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, include the following: C. V. Woodward and F. C. Reed will have charge respectively of the Baltimore and Huntington, West Virginia, offices; while R. J. Ross and W. F. James will assume important positions with two divisions of the company's Philadelphia offices.

An addition is being made to the plant at Keplers, Pennsylvania, maintained by Binney & Smith Co., 41 East 42nd street, New York, N. Y., as a distributing point for its manufacture of carbon black. The company reports a large demand for Micronex, one of its leading productions.

W. D. Friend has been placed in charge of the Pittsburgh territory of The Empire Tire & Rubber Corporation, Trenton, New Jersey, his headquarters being at 5931 Alder street, Pittsburgh, Pennsylvania.

In honor of the seventy-two or more firms of Philadelphia which have had a continuous existence for more than 100 years, the Philadelphia Chamber of Commerce gave on March 22 a luncheon at the Bellevue-Stratford Hotel, of that city. Among the organizations represented was the well-known firm of H. W. Butterworth & Sons Co., manufacturers of cell driers, which was established in 1820.

The South

Plans have been prepared by The Roanoke Tire & Rubber Co., Roanoke, Virginia, for a three-story factory, of brick and steel construction, where tires and tubes will be manufactured, and in addition a patented type of tire valve. The company's executives include the following: Charles H. Keiffer, president; John W. Wright, vice-president; L. E. St. Clair, secretary and treasurer; E. B. Petty, production manager; Edward Farmer, assistant factory manager; A. Buck, construction and maintenance department, and Thomas E. Wright, general counsel.

Cord and fabric tires are soon to be produced in Birmingham, Alabama, by the Murray Tire & Rubber Co., a concern recently organized, and with a capital of $150,000. Property has been acquired at Twenty-sixth avenue and Twenty-sixth street, Birmingham, and additions to the already existing building will be made after operations have been begun. Nine branches for the distribution of the tires have already been located, the chief ones to be at Dallas and Shreveport. W. F. Tidyman is factory manager.

The Rubber Trade in New Jersey

Manufactured Goods

Without exception every rubber manufacturer in Trenton is running to normal capacity and many of them in excess of normal. Manufacturers of garden hose are weeks behind on shipments and all local mills making this line will be busy throughout April on orders booked months ago for early spring shipment. This is without taking into consideration the repeat orders which always follow the early business and the volume of which depends considerably upon the weather. With anything like a normally dry spring, garden hose manufacturers should be kept busy up to the latter part of June in supplying goods for this season.

Other mechanical goods lines are in somewhat similar condition. Tire manufacturers are also busy, while the mills making molded goods and specialties are away behind on orders. This manufacturing activity is, however, not altogether an unmixed blessing, for some of the manufacturers lament the low range of prices at which considerable business was booked in the fall of 1922 when the prices of all kinds of raw materials were very much lower than at present. However, all are looking forward to a more sensible competition for business when sales efforts for the season of 1924 begin.

Trenton

The next regular meeting of the Rubber Manufacturers Association of New Jersey will be held on the evening of April 9 at the Stacy Trent Hotel.

Rubber manufacturers of New Jersey are unanimous in voicing approval of the reappointment of Col. Lewis T. Bryant to the office of State Commissioner of Labor. It should be remembered that the Rubber Manufacturers Association of New Jersey strongly urged this reappointment upon Governor Silzer.

Many of the Trenton rubber mills are installing and others have contracted for considerable additional equipment.

The Acme Rubber Manufacturing Co. is increasing its boiler capacity about 40 per cent. It has a number of 60-inch mills ordered for installation within a short time. All of these will be motor driven and equipped with the latest improvements, including safety devices. This company has been operating a night force all through the winter months and expects to have to continue doing so for the next three months.

The Home Rubber Co. has additional machinery ordered which will be installed in the near future. A continuation of over-work time at this plant is also recorded.

The Hamilton Rubber Manufacturing Co. has ordered several 60-inch mills of the latest type, which will be installed in the next month or two. This company reports a substantial increase in business in many lines as compared with last year.

The William R. Thropp Sons Co. report the booking of a number of contracts for mills, calenders and other machinery from Trenton manufacturers as well as others. All mills made by this company are now equipped with the Thropp safety device, which insures the stopping of the mill within 6 inches of roll revolution. The State Labor Department of New Jersey is now requiring all mill installations to be protected in this manner.

The hard rubber manufacturers, Joseph Stokes Rubber Co. and Luzerne Rubber Co. are both enjoying a very satisfactory volume of business. The increased automobile production has augmented the business of both these plants because of the consequent increase in demand for battery jars.

The Ajax Rubber Co. continues to run at full capacity and reports continued increase in business notwithstanding the advance in tire and tube prices.

General C. Edward Murray, formerly head of the Empire Tire & Rubber Corporation, was chairman of the drive that raised $600,000 for the erection of the new Young Women's Christian Association building. General and Mrs. Murray contributed $50,000 toward the project. George R. Cook, president of the Acme and Hamilton Rubber Manufacturing companies, donated $25,000, while William J. B. Stokes, of the Thermoid Rubber Co., and Thomas H. Thropp, president of the Trent Rubber Co., each gave $10,000. The sum of $5,000 was given by Frank W. Thropp and John E. Thropp, of the Tropp Machine Co.

Since the United & Globe Rubber Corporation took over the United & Globe Rubber Company, John S. Broughton, who was president of the latter company, has been devoting most of his time to the Globe Rubber Tire Corporation. Mr. Broughton is chairman of the new concern, and spends most of his time at the big plant.

The Murray Rubber Co. manufactures a complete line of cord and fabric tires, and heavy duty cord tires, also rubber belting, hose, matting, etc., for all purposes. It also manufactures Empire tires and tubes and general mechanical goods.

Net sales in 1922 were $5,245,816.23, on which net profits were $615,563.91. Net sales from January 1, 1923, to March 15, 1923, were $1,227,044.04, while during the same period of 1922 net sales were $764,772.47.

The United Clay Mines Corporation, Trenton, specializes in both domestic and imported kaolins that are used in the production of rubber footwear, pneumatic and solid tires, and mechanical and molded rubber goods. Due to this growing market, the United Clay Company is now maintaining a large stock of pulverized kaolin at Trenton, while other distributing points will be added from time to time.

New Jersey

Judge Charles F. Lynch, of the United States District Court, after having affidavits submitted to him concerning the Howe Rubber Corporation, New Brunswick, dismissed the petition asking for the appointment of a receiver for the concern. Early in February Miss Anna Gregson of New Brunswick, holding $4,000 worth of stock, and Morris Cohen of Newark, holding $1,000 worth of stock, petitioned the court for the appointment of a receiver. Miss Gregson claimed that she had been misinformed regarding the company's financial standing. It was shown that the company was in a sound financial position and that its business was the largest in the history of the concern. It was also proved that the company was far behind in filling its orders.

Business has increased about 100 per cent over that of last year at the plant of the Michelin Tire Co., Milltown, and the company is now running three shifts, including holidays. The company has many orders on hand and is employing 2,000 hands. Another rise in the price of tires is predicted by J. Hauvette Michelin, general manager of the company, who claims that this is made necessary by the increasing cost of raw materials and fabrics.

The accounting of Edmund A. Hayes as receiver for the Hardman Rubber Co., New Brunswick, showing a payment of $254,277 to Arthur W. Rinke as trustee for the bondholders and a net balance of $3,731.50, also to be paid him, has been approved by Vice-Chancellor Backes in the Court of Chancery. August C. Streitwolf, counsel for Mr. Hayes, asked for the discharge of the receiver, and this was agreed upon. The account showed receipts of $335,420. Besides the payment to the bondholders, there were disbursements of $24,153 of a miscellaneous nature. The accounts showed a loss of $41,697 on book accounts and $11,359 on inventory of merchandise.

L. E. Wright has been appointed factory manager in addition to his duties as chief engineer of The Howe Rubber Corporation, New Brunswick. Mr. Wright has had wide experience in industrial engineering, having designed and installed the manufacturing equipment of several important plants. W. W. Hall, for several years traffic commissioner of the Akron Chamber of Commerce, has resigned to become traffic head and purchasing agent of the Howe corporation.

De Mattia Bros., Garfield, New Jersey, specializing in tire molds, announce that David Bridge & Co., Limited, Castleton, Manchester, England, will act, for the continent of Europe, as sole licensees and manufacturers of De Mattia core chucks.

The Rubber Trade in Rhode Island

That many of the plants included in Rhode Island's manufacturing, rubber and coordinated industries are enjoying the greatest boom since the nation-wide depression disrupted the business of the country is indicated in the reports coming from them. Practically every one of these plants is being operated on day and night shifts to full capacity, or nearly so, and in some instances, especially those producing footwear, it is said that they have enough fall orders on hand to insure their steady operation at present pace throughout the greater part of 1923. Several concerns are advertising for help, both experienced and inexperienced, both classes of which, it is said by factory officials, are scarce. With no general labor controversies to cloud the situation and plenty of orders on hand the prospects for the future are especially encouraging.

The factory of the O'Bannon Co., at West Barrington, producing artificial leather for use in automobile upholstery, reports business good. A night shift of between 30 and 40 men began operations about the middle of the month, which is to be increased as rapidly as conditions warrant, and it is expected that the entire plant will be running at capacity in a short time.

The Revere Rubber Co. is preparing for a material increase in its business in the next few months, with prospects for a continued activity practically for the remainder of the year. To meet this increase extensive improvements and additions have been planned which with the opening of settled weather conditions will be pushed forward rapidly, at the company's plant on Valley and Hemlock streets, Providence. Included in the added facilities, and one of the first to be installed, is an immense vulcanizing equipment that will greatly increase the efficiency of this department.

Reports from the Davol Rubber Co. indicate greater activity than usual with all the departments affected. For several weeks the concern has been calling for additional help, especially young women over 16 years to learn the work of the various branches of the plant. Just at the present time one of the departments wherein additional assistance is needed is the bathing cap section, where orders have accumulated to a considerable extent during the last few weeks, and overtime will probably be necessary to catch up with the demand in time for the opening of the summer bathing season.

Business is humming at the Alice and Millville mills of the Woonsocket Rubber Co. and considerable difficulty is being experienced in securing sufficient help to meet the increased production demanded by the constant receipt of orders on footwear from all sections of the country. This is particularly the case on gum shoes and gaiters, an especial inducement being offered for women on gaiters who, contrary to the usual practice, will receive pay while learning.

Details of the plan for reorganization which it is hoped will become operative at an early date have been sent to the stockholders of the American Wringer Co. by the stockholders' committee. On February 2, 1921, all the property of the company was placed in the hands of a receiver, as the affairs of the company were very much involved and the equity of the stockholders was seriously impaired. In common with business generally, the business of the American Wringer Co. was very dull during the summer of 1921. With the improvement in 1922, however, inventories were reduced, sales increased, and the business transacted by the receiver resulted in a profit to the company. During the eleven months ending November 30, 1921, the total sales amounted to $1,121,405. For the corresponding period of 1922, the sales amounted to $1,413,248. On November 26, 1922, the company had substantially $963,000 in current assets. Liabilities, including the balance of unpaid claims of all kinds, approximated $949,000.

A. S. T. M. COMMITTEE HOLDS SPRING MEETING

On March 2 and 3 the regular spring meeting of Committee D-13 of the American Society for Testing Materials was held in Providence, Rhode Island. About thirty members and guests attended the various sessions, where A. E. Jury, chairman of the committee, presided.

Final reports were made by sub-committees having charge of the drawing up of tentative specifications for imperfections and tolerances for cord tire fabrics and for square-woven tire fabrics, and these reports will be taken up at the June meeting for adoption. Other work in progress includes the preparation of standards and specifications for hose, belt, and numbered ducks; classification and identification of fibers and fabrics; and textile nomenclature and definitions.

The Rubber Trade in Massachusetts

Manufactured Goods

Rubber plants of every description are now busy. The severe winter weather has created a heavy demand for rubber footwear and druggists' sundries. Factories are well sold ahead on canvas footwear and are anticipating a big year in white sport and bathing shoes. Crêpe rubber sole demand is increasing. Considerable "flapper" trade is also developing among students in girls' schools, where crêpe soles are being worn primarily as a fad.

Tire production is increasing as the driving season approaches, and in another month will be at capacity. Automobile topping demand was never better. Spring styles of waterproof clothing are ready but business is somewhat delayed by the late cold weather. Although there has been a seasonal decline in building operations and advancing material costs may curtail the building boom, enough has been in progress to insure good business to insulated wire makers. Projected new hydro-electric installations are also promising.

Mechanical rubber goods output has continued good, and there is now considerable seasonal activity in jar rings and garden hose. Increasing uses of radio hard rubber parts are stimulating that branch of the industry. Reclaimers are again active.

Boston Automobile Show

The Automobile Show held at Mechanics' Building from March 10 to 17, inclusive, was largely attended and dealers generally report record sales. Deliveries seem to be their only worries.

None of the tire companies, except the Grow Tire Co., exhibited directly, although tires of several makes were noticeable in the displays of distributers and accessory dealers. Hewitt tires were shown by the Green & Sweed Co.; Lambert Trublproof tires by the J. W. Coyle Corporation; Massachusetts truck and Star pneumatic tires by the Massachusetts Tire Sales Co., Inc.; Seiberling cords by the Miles Piston Ring Sales Co.; Sewell Cushion wheels by the Sewell Cushion Wheel Co.; standard makes by the Central Automobile Tire Co.; and Superior cords by the Merchants Tire Co.

Tire buffers were exhibited by the Eggleston Supply Co.; tire changers by the Weaver Manufacturing Co.; tube patches by the El-Be Sales Co., Harris Co., Inc., and Weldo Patch Manufacturing Co.; tire valves and pressure gages by A. Schrader's Son, Inc.; Eastern Rubber Co., Magic Rubber Mend. The Boston Blacking Co. offered tire paint, patching and vulcanizing cements; Moore, Worrall & Kling, gasoline hose and fittings; the Russell Manufacturing Co., brake linings, clutch facings, fan belts, transmission belts, etc.

The New England Tire Demand

New England's tire demand for the year 1923 will not be far from 3,375,625 tires. At the rate of three tires per car average for replacements, the 856,375 motor vehicles registered at the end of 1922 in the six states of this group, more than half of them in Massachusetts, will require 2,569,125 tires. To this may be added 806,500 tires, at the rate of five tires per car, for original equipment and one spare on the 161,300 new cars which it is estimated will be sold in New England during the year. This represents a 10 per cent advance over the 146,636 increase in 1922 registration.

Massachusetts ranks ninth among all the states in total automobile registration, but led all the states except California in percentage of increase, which was 24.7 per cent against 25.1 per cent for California. The total registration of the state is 449,838 vehicles, of which 65,715 are trucks.

Boston

That no incorrect inference may result from the item regarding the Phillips Rubber Co. in this column last month, it should be explained that this firm now is and always has been a Massachusetts voluntary trust. There has been no change in the status of the business except in personnel, as follows: B. E. Phillips and O. P. Hussey were the original trustees. At a meeting of the stockholders, on January 23, James S. Allen was elected to replace Mr. Phillips. Mr. Hussey continues as the other trustee and is treasurer and general manager. The firm is doing a steadily increasing business in molded rubber goods for special mechanical purposes at its new plant in Cambridge.

Direct steamship service between Boston and New Orleans, Louisiana, was begun by the Southern Pacific Railroad last month, when a steamer of 4,000 tons' capacity sailed from the latter port on March 22, and on arrival will dock at Battery Wharf, Atlantic. Frequency of sailings will depend on the business developing. The new service enables cotton for New England mills to be transhipped here instead of at New York as formerly, and should result in more expeditious handling.

The United States Tire Co. has moved into larger quarters in its new building at Charles River road and Vassar street, Cambridge.

H. M. Haven & A. T. Hopkins, Inc., Consulting and Designing Engineers, 40 Court street, Boston, Massachusetts, are designers of industrial buildings and power plants; refrigerating, cooling and air conditioning plants; experts in engineering and business investigations and reports; appraisals and valuations for tax, insurance and finance purposes, management and corporate financing.

Arthur T. Hopkins who has had a wide experience as factory manager and industrial engineer and is well known to rubber manufacturers will have charge of the rubber service department.

Massachusetts

At the plant of the Converse Tire Co., Malden, production has reached 500 tires and 1,000 tubes a day and is still below the demand. Through the "protected dealer plan" of factory to retailer direct, which was originated by Mr. Converse, sales have doubled during the past year, while Converse compression tread cords are making firm friends wherever they go.

The Hood Rubber Co., Watertown, has sufficient business on hand in its rubber footwear department to insure capacity operation until next December, and in the canvas footwear department forward orders are booked at capacity until August.

The Tyer Rubber Co., Andover, Massachusetts, has discontinued the manufacture of Tyrian tires and tubes and is selling its tire building machinery and equipment. The manufacture of rubber footwear has been begun on a small scale and will be extended in quantity and variety as new machinery and equipment are installed. The firm's well-known line of druggists' and surgical sundries is being continued.

The Cambridge Rubber Sales Corporation has been organized under Massachusetts laws for better service to the retail trade of the Cambridge Rubber Co., Cambridge. The main office is at 186 Lincoln street, Boston, and branches have been established at 127 Duane street, New York, N. Y., and at 19 South Wells street, Chicago, Illinois.

Warren Macpherson, president of the Cambridge Rubber Co., is again in Europe looking after business interests there, and if time permits may continue to the East and look into the crude rubber situation.

John G. Magaw, of the Hood Rubber Products Co., Watertown, estimates the 1923 market for four-buckle gaiters for men, women, and children at 10,000,000 pairs against a possible production of 7,000,000 pairs by all the factories in the country. Production for the year 1922 is believed to have been about 4,000,000 pairs, which were entirely sold out, while consumption for the preceding year was about 3,000,000 pairs. He regards 20 per cent as a safe normal carryover, which does not now exist.

The Rubber Trade in Ohio

Manufactured Goods

Advancement of automobile tire prices 10 per cent on the part of practically the entire industry, coupled with peak production, will make the second quarter of the year a prosperous one for the rubber industry, although the third and fourth quarters are not so certain.

During the first quarter of the year increased material and labor costs have combined to reduce still further the small margin of profit shown for the past year, and the price advances came at a time when it was admitted that many of the smaller companies at least were beginning to feel the pinch.

The industry as a whole, in every department, is operating at peaks never before conjectured. Increases have not been possible during the past months and for that reason the district is probably making 110,000 of the 185,000 tires estimated as the daily American production at the present time.

Increased demand for reclaimed rubber has resulted in speeding up of production on the part of reclaimers. Boot and shoe business being booked during the present selling season continues to be excellent. Druggists' sundries business is developing along logical and conservative lines without any of the characteristics noted in the tire departments. Increased buying on the part of railroads and other users of mechanical rubber goods, as well as increased heel sales, are adding to production in the mechanical goods departments.

Planting Opinions of Prominent Rubber Men

Paul W. Litchfield, vice-president and factory manager of The Goodyear Tire & Rubber Co.; Frank A. Seiberling, president of the Seiberling Rubber Co.; and W. O'Neil, general manager of the General Tire & Rubber Co., have issued statements regarding planting rubber in the Philippines.

Paul W. Litchfield reviews the history of crude rubber prices since 1909, showing that the price of 34 cents on February 1 was lower than the prices which obtained from 1909 to 1920. Growing rubber in the Philippines will not make for a reduction in rubber prices, it is asserted.

Plantation rubber costs on an average of 25 to 30 cents a pound to produce. The price would have to be from 30 to 35 cents a pound before capital would be justified in starting plantations because of the heavy initial expense in clearing jungles, in recruiting labor, in building mills, towns, roads, railroads, etc., and the further fact that the investor would have to wait seven years before he could begin to get any returns on his investment.

It is only by more new plantations and large capital investments that we can be assured of an adequate supply of low-priced rubber for the future. There is no division of opinion among American tire manufacturers as to the desirability of producing rubber on American soil and in the Philippines if it can be done.

Rubber cannot be raised more cheaply in the Philippines than in Sumatra. Labor is higher in the Philippines and less desirable for this particular work.

The statement shows how Philippine immigration laws militate against the introduction of rubber plantations, recognizes the situation of the rubber growers who have sustained huge losses, and places faith in the operation of the law of supply and demand to adjust this situation with restrictive legislation.

Frank A. Seiberling in his statement stresses the labor situation in the Philippines and reviews the efforts made by The Goodyear Tire & Rubber Co. ten years ago to grow rubber there. The company sustained losses and was compelled to stop its efforts because of the labor situation. He suggests that a temporary abrogation of the immigration laws, permitting the importation of Chinese labor, might make possible the starting of plantations. Philippine labor would probably be able to operate the plantations after they had been set out.

Mr. O'Neil's statement characterizes the expenditure of $100,000 for rubber investigation as pure waste of the peoples' money and asserts that the facts regarding the possibilities of rubber production are available from a dozen reliable sources.

The suggestion that the immigration laws of the Philippines be changed holds startling and dangerous possibilities. Most Americans prefer to have ten cents a day labor working for Great Britain and Holland rather than under the Stars and Stripes.

We all regret that the British Government has put on the production tax due to the fact that the plantations have been producing more rubber than the world could use. The fallibility of government in business is well known. But why aggravate that situation by also putting the American Government in the rubber business? In my opinion Americans need not envy or compete with a foreign industry that cannot find employment for men at 10 cents a day.

General Tire Doubles Capacity

Because of delays on equipment, the General Tire & Rubber Co. was unable to occupy its new addition as expected, but it is believed that next month production will be started there. The addition will double the plant capacity and production will be rapidly increased to 4,000 or more tires a day.

A new patented process of making cord tires which produces a smoother tire has been in use in the General factory for several months. The number of cross threads in the cord fabric is much less under the new process than under the old. While the weaving process differs somewhat from that of the regular cord fabric its cost is practically the same.

American Tire Reorganized

The American Rubber & Tire Co. has been reorganized and sufficient new working capital obtained from the officials and larger stockholders. Floyd C. Snyder, son of the recently re-elected president, Fred H. Snyder, has been elected vice-president of the company and will take an active part in its management. Thomas J. Johnson has been elected factory manager and R. R. Stull sales manager. Among the officers reelected for the ensuing year is Henry L. Hauk, for a long period secretary and treasurer. The reorganization forecasts a more aggressive sales and advertising policy.

The company reports tire production at the peak of 1,000 tires a day, while its bathing shoe business, which was originated two years ago, is so large that the plant is hopelessly behind on orders.

Akron

The Philadelphia Rubber Works Co. reports that reclaiming operations are at peak and that the company may be compelled to expand its production facilities. During the boom period a new plant was built at Buffalo, New York, but this has been sold and operations are confined to existing facilities.

The Vultex Co., at Barberton, has put on a night shift to meet increased demand for reclaims. A part of the increased business is due to mechanical and other rubber goods which the reorganized company is now making.

Operations by the India Tire & Rubber Co. during the past year made up for losses sustained in operations and write-offs last year. The net earnings of the company during the past year amounted to $274,630, while the deficit incurred the previous year amounted to $274,487.

W. J. Cope, for the past ten years assistant treasurer of the Mohawk Rubber Co., has been named treasurer to succeed C. W. McLaughlin. Sales of the company are reported in the neighborhood of $2,000,000 for the past year, while net profits are in the neighborhood of $190,000. Last May the company converted part of its common stock into preferred and has been earning and paying dividends on this preferred since that time.

The Trump Brothers Rubber Co., in East Akron, has held its plans to build tires on a commercial basis in abeyance pending stabilization of the tire market. The company has been experimenting with a new cord tire, but market conditions at the present time are considered far from favorable for its introduction. Meantime the company is increasing its rubber belt and

other rubber sundries production. More than 25,000 men's belts are being made daily.

The Firestone Tire & Rubber Co. has moved its mechanical department into the new solid tire building located south of Plant 2, which has been completed more than a year. It is believed that spring will find the entire plant utilized for production. The new factory is a sixth of a mile long and 250 feet wide. It contains every modern factory convenience and was intended as a model rim plant.

Ohio

Executives of the Birmingham Iron Foundry, Derby, Connecticut, manufacturers of rubber mill machinery, announce the appointment of Andrew Hale as the company's western sales representative, with headquarters at Akron, Ohio. Mr. Hale is a man of wide experience in the rubber industry, and was previously connected with the Firestone Tire & Rubber Co., and later with the Miller Rubber Co.

The Northern Rubber Co. has been incorporated by the syndicate which recently purchased the Biltwell Rubber Co. plant at Barberton which has been idle for more than two years. It has an immediate capacity of 500 tires and with some machinery addition can be brought to a capacity of 2,500 tires a day. The purchase price was $200,000, according to Allen F. Ayers, receiver of the Biltwell company. The company has $250,000 worth of preferred stock and 20,000 shares of common, none of which is to be offered to the public. R. W. Kent, formerly with Republic Rubber Co., is vice-president and factory manager, and Owen Moynihan, formerly with Malay Rubber Co., is sales manager. Production will be started on a small scale in the near future.

The Anchor Rubber Co., of Barberton, formerly manufacturing rubber balloons and other dipped goods, has been sold to Franc Zachar, one of the principal stockholders of the former company, for $15,000.

The Chemitex Co. has leased the Interlocking Cord Tire Co. plant, at Mogadore, for production of window shade cloth. Machinery of the former occupant will be removed. The Interlocking company has not been operating recently, although the company recently floated a bond issue.

Theodore E. Smith, founder and for twenty years publisher of *The India Rubber Review*, is confined to the City Hospital here as the result of being struck by an automobile truck in front of the bank of which he is president. While first reports were that Mr. Smith was fatally injured, it is now reported that his injuries are confined to a broken leg and that he is resting easily.

The plant and all the assets of the Anchor Rubber Co., Barberton, Ohio, an organization for some months in the hands of a receiver, have been taken over by a new concern now being established under the name of The Liberty Rubber Co. Production of the same kind of goods formerly manufactured by the Anchor company will be continued, such goods being toy balloons, advertising balloons and other novelties along this line. F. B. Pastir will be in charge.

The Victor Rubber Co., Springfield, Ohio, manufacturer of tires, tubes and rubber matting, during 1922 realized from operations a profit of $86,351.02, as compared with a deficit from operations during 1921 of $498,042.48, and similarly a deficit in 1920 of $106,275.06. Victor net sales for 1922 amounted to $1,818,809.34, while as a result of improvements in equipment and manufacturing methods the company's productions have been rendered more satisfactory and operating costs have been reduced.

The plant formerly owned by The Gordon Tire & Rubber Co., Canton, Ohio, is being offered for sale by the company's receivers, A. G. Ryley and A. B. Clark, who are prepared to take up negotiations with anyone interested.

The Qualitex Co., Cleveland, has purchased the plant at Newton Falls, Ohio, leased by the Hubbell Tire & Rubber Co., and is equipping it with presses to manufacture mechanical hard rubber goods. It is expected that the plant will be ready for production about April 1. The company was first incorporated under the name of "The Duratex Co.," but in November, 1922, took its present name, the reason for the change being that a company in New Jersey was found to be of the same name. Executive officers are: J. G. Blackstock, president and general manager; P. A. Porteous, vice-president and treasurer; J. J. Monahan, secretary and treasurer.

No changes were made at the recent election of officers and directors of The Dayton Rubber Manufacturing Co., Dayton, Ohio, except in the selection of A. L. Friedlander, factory manager of the company for many years, as second vice-president. Other officers and directors include: John A. MacMillan, president and general manager; C. E. Hooven, vice-president and secretary; Robert F. Brown, treasurer; E. F. Riggs, assistant treasurer and secretary; and directors John A. MacMillan, Robert F. Brown, C. E. Hooven, A. L. Friedlander, Paul C. Hunter, and F. H. T. Potter. The year 1922 represented the company's best business year, while excellent prospects are reported for 1923.

With the opening of the present year the Cleveland offices of the Tire and Rim Association of America, Inc., were removed to 1401-1402 Cleveland Discount Building, Superior avenue and East Ninth street. George L. Lavery is general manager of the organization.

Reports rendered at the annual meeting of The Denman-Myers Cord Tire Co., Warren, Ohio, indicate that the company is in a prosperous condition, with excellent prospects for the future. Walter E. Myers is president and chairman of the board of directors, F. F. Dugan is vice-president and director of sales. The unanimously reelected board of directors consists of the following: Walter E. Myers, W. R. Denman, F. F. Dugan, L. M. Harper, P. A. McCaskey, J. E. Morris, E. H. Peck, W. B. Prenter, F. C. Raymond, F. W. Stillwagon, and H. F. Webster.

The Rubber Products Co., Barberton, Ohio, has suspended the production of tires and is now concentrating on the production of rubber sundries and other novelties and small goods. In the latter lines business is so good that while several months ago it was believed that some new financing would have to be done, this plan has been entirely dropped. Exceptional success has attended the production of a new rubber syphon. A new line of bathing caps is also being made and other lines are contemplated.

In order that a definite reorganization of the Republic Rubber Co., Youngstown, Ohio, may be consummated the company will be sold about the middle of April as a going concern. This formal step is customary in receivership proceedings. The properties will subsequently be vested in a new corporation to be organized under substantially the same name. This assures taking the business out of the receivership and its continuance under substantially the old Republic name.

The bankruptcy case against the Liberty Tire Corporation, Carey, Ohio, has been dismissed and the plant has been placed in temporary receivership until a reorganization can be effected. B. F. Wulff, vice-president and general manager of the Studebaker-Wulff Rubber Co., has been appointed receiver, and if satisfactory arrangements can be made with the creditors and stockholders, the factory may be merged with the Studebaker-Wulff Rubber Co. plant at Marion, Ohio.

Rubber Trade in the Midwest

Midwest Rubber Manufacturers' Association

Subjects of unusual interest were discussed at the regular monthly meeting of the Midwest Rubber Manufacturers' Association, which was held on March 20 at the Hotel Cleveland, Cleveland, Ohio.

The opening address was delivered by Wesley E. Wilson, vice-president and general sales manager of The Akron Rubber Mold

& Machine Co., Akron, Ohio, the subject being "What Future Activities Must Be Inaugurated to Build a Bigger and Stronger Association?" Mr. Wilson stressed the need of interchange of comparative statistical sales information and monthly comparative statistics, the object in view being the instituting of a comparison by the individual member of his own monthly sales and costs with the total sales and costs of the association membership.

In a short speech Mr. Seiberling, of The Seiberling Rubber Co., Akron, Ohio, also pointed out the advantages of cooperation, considering it an essential in the rubber industry as in other lines of business.

Following the luncheon speeches were made by W. D. Hines, representing The Firestone Tire & Rubber Co., Akron, Ohio, on the timely subject "The Crude Rubber Situation," and by E. S. Babcox, editor of *The India Rubber Review*, who discussed the question "Can the Small Manufacturer Survive?"

The matter of constructive uniform cost accounting methods, which had been up for discussion at both the St. Louis and Chicago meetings, was also carefully considered, and questions answered by E. W. Kath, of The Cleveland Rubber Corporation, Cleveland, Ohio. This was followed by a general discussion of subjects of especial interest to the industry.

At the directors' meeting Thomas Follen, president of The Lion Tire & Rubber Co., LaFayette, Indiana, was elected president of the association as successor to W. W. Wuchter, who presented his resignation. W. E. Wilson, vice-president and general manager of The Akron Rubber Mold & Machine Co., was appointed treasurer, while Sydney J. Roy, general manager of The Hannibal Rubber Co., Hannibal, Missouri, was elected first vice-president, and W. G. Brown, of The Spreckels "Savage" Tire Co., San Diego, California, second vice-president. Four new directors whose terms expire in 1926 are as follows: William Stillwell, president of The Eclat Rubber Co., Cuyahoga Falls, Ohio; William L. Burges, president of The Burkoe Tire & Rubber Co., St. Louis, Missouri; M. J. Flynn, treasurer of The Inland Rubber Co., Chicago, Illinois; and Charles J. Venn, president of The Century Rubber Works, Cicero, Illinois.

Servus Company Begins Production

Production recently began at the new plant of The Servus Rubber Co., Rock Island, Illinois, where canvas shoes with rubber soles are now being manufactured. Later rubber boots and shoes will also form a part of the company's line.

The first unit of the Servus plant is a three-story brick building 300 by 60 feet. With the additional smaller constructions there is a combined floor capacity of 59,464 square feet. With present equipment the plant can produce daily 8,000 pairs of finished canvas rubber soled shoes besides rubber boots and shoes. Although the cost of the present plant together with land and equipment has been in excess of $300,000, the Servus company begins operations with no indebtedness and with working capital sufficient for its needs.

The list of officers includes men of much experience in the rubber industry and is as follows: Judson J. Adams, president; Lawrence B. Icely, vice-president; John T. Crowley, vice-president; Irvin S. Rauch, treasurer; and William T. Church, secretary. The directors are Walter A. Rosenfield and Harry H. Cleaveland.

Chicago

The Krippendorf-Tuttle White Cliffs Products Co. has recently established a research department and control laboratory where all questions relating to the use of chalk in rubber compounding will be carefully studied. The general sales offices are located in the People's Trust & Savings Bank Building, Chicago, Illinois.

The Midwest

The organization formerly known as The Grand Rapids Tire & Rubber Corporation, Grand Rapids, Michigan, will hereafter carry on business under the name of the Corduroy Tire Company. Sales during the year 1922 of "Corduroy" cord tires have been unusually large, according to C. S. Dickey, treasurer of the company.

The outlook for the Black Hawk Tire & Rubber Co., Des Moines, Iowa, appears to be most encouraging. This company, established in 1920, has more than 1,000 dealers in the state of Iowa alone. No branches or distributers are maintained, it having been found advisable to do business directly with dealers only. Factory operations are now being carried forward with day and night shifts, and 25,000 tires will be shipped during the month of March. Machinery is to be installed during the year which will increase the plant production by 50 per cent. H. G. Curtis is sales manager.

The National Pigments & Chemical Co., St. Louis, Missouri, is offering rubber goods manufacturers an exceptionally fine grade of barytes particularly suited to compounding since it is clean, absolutely dry, and of 350-mesh fineness. This barytes is highly non-hygroscopic and therefore free from any tendency to cause porosity in vulcanized goods.

The name of the Double Fabric Tire Co., Auburn, Indiana, has been changed to Auburn Rubber Co. This in no way affects the financial standing or policies of the company, nor does it change the ownership in any way. It is done because the old name led to misunderstandings as to the exact nature of the product.

The Rubber Trade on the Pacific Coast

Manufactured Goods

Despite the fact that the trade had on March 15 to absorb a "shock" of 10 per cent more on tires and tubes, in addition to the 12½ per cent general increase on January 1, tire makers and distributers report a gratifying growth in business at practically every large distributing point on the Pacific Coast. Spring dating business with some concerns brought in a flood of orders. The demand for mechanical rubber goods in oil fields and at the refineries is particularly good, and this holds quite true in mining, irrigating, and manufacturing. Some of the larger rubber companies report sales of mechanicals 35 per cent better than a year ago; while rubber footwear averages about 30 per cent. Orders are now being taken for delivery in November. Footwear prices rose 15 per cent on February 1 and another 10 per cent was expected April 1. A move toward standardization is noted in the reduction of varieties by about 30 per cent. Tire repair materials are "looking up."

Westinghouse Changes

A number of changes in the Los Angeles office of the Westinghouse Electric & Manufacturing Co. have been announced by W. S. Rugg, general sales manager of the company.

The Power Division has been changed to the Central Station Division and J. C. Jones has been appointed manager. Mr. Jones is also in charge of the sale of supply apparatus in that territory. The Railway Division has been changed to the Transportation Division and G. B. Kirker has been appointed manager. A Merchandising Division has been established, with J. H. Jamison as manager, and an Engineering Division has also been established, with R. A. Hopkins as manager.

Los Angeles

President Edward G. Wilmer of the Goodyear Tire & Rubber Co. of California at the annual meeting of the stockholders in Los Angeles, March 15, reported that the net profit of the tire company and its subsidiaries for 1922 was $788,817.12. Net sales were $12,392,616.42; cost of sales, $8,878,114.76; gross profit from operations, $3,514,501.66, or, with miscellaneous sales of $108,702.40 added, $3,623,204.06. Selling and administrative

expenses were $2,057,981.16. Profit available for interest, reduction of deferred expenses and deficit, $1,565,222.90; less interest ($446,706.82) and deferred factory expense ($329,698.96), $776,403.78; net profit, $788,817.12, or $9.86 a share. A deficit of $3,157,762 on March 1, 1921, was reduced on December 31, 1921, to $1,672,453; and on December 31, 1922, it had been cut down to $835,135.

While Goodyear net sales in 1921 were higher ($14,069,733), the company in that year sold but 682,000 units, as compared with 883,000 in 1922, general trade prices being lower. The average daily production of casings in 1922 was 2,870, whereas the 1923 average is 4,800 thus far. It was deemed advisable to defer action on the preferred dividends. On the preferred stock of the Goodyear Textile Mills, however, the regular dividend of $1.75 and a deferred dividend of $1.75 were declared. This concern had profits from sales in 1922 of $186,656, less $23,000 credited to reserve for contingencies, or $163,656 net, an average of $8.56 on each preferred share. All the officers and directors were re-elected.

W. Howard Ogborn, manager of the special dry colors department of the Ault & Wiborg Co., Cincinnati, Ohio, has been studying rubber trade conditions in coast cities during the past three weeks.

H. A. Farr, Pacific Coast manager of tire sales for the United States Rubber Co., with headquarters at San Francisco, has been investigating trade conditions in Southern California with the aid of J. B. Magee, manager of the Los Angeles branch. The latter reports last month's general sales about 35 per cent better than for March, 1922. Two salesmen more have been added, making an outside force of thirty-two.

The E. M. Smith Rubber Co., Los Angeles, is very busy making oil fields supplies, conveyor belts, friction clutches, brake lining, and general mechanicals. Recently the company installed two new 60-inch mills, a new 53-inch double-deck belt press, and doubled its boiler capacity. At the company's asbestos plant in Downey, a Los Angeles suburb, the employes work four nights a week. An addition will soon be made to the works. President E. M. Smith announces that his concern will at once erect a $500,000 plant on a 13-acre plot near Los Angeles harbor for the manufacture of steel oil derricks. The concern also had a corrugated steel pipe plant at Houston, Texas. With Mr. Smith are associated his brothers, Walter and J. S. Smith.

A steady increase in sales is reported by the Caterpillar Tire Co. of America, particularly in eastern and northern states, where snow and heavy road conditions have sharpened the demand for non-skid casing protectors. Dennis F. O'Brien, of New York, counsel for the Fairbanks-Pickford United Artists' Corporation, has been forming a company for the exploitation of caterpillar tires in a territory comprising the eastern states, and recently had several conferences with President F. G. Paine, of the Caterpillar Tire Co., 225 West Pico street, Los Angeles.

A steadily growing output of casings and tubes is reported by the Samson Tire & Rubber Co., whose well-equipped plant is at Compton, a Los Angeles suburb. The company recently established distributing houses at Salt Lake, Houston and Kansas City, Kansas.

Paul W. Litchfield, vice-president and factory manager of the Goodyear Tire & Rubber Co., Akron, Ohio, has been spending the past three weeks inspecting the company's 50,000-acre cotton plantation in Salt River Valley, Arizona, and the plant of the California Goodyear company in Los Angeles.

A. A. Somerville, in charge of the rubber department and vice-president of the R. T. Vanderbilt Co., Inc., 50 East Forty-second street, New York, N. Y., has been spending the month of March in California and on the Pacific Coast, where he has been instrumental in establishing another of his company's warehouses.

San Francisco

The King Tire & Rubber Co. has taken over the plant formerly owned and operated by the Sturges Tire & Rubber Co., Foothill Boulevard and 105th avenue, Oakland, and will confine itself practically to making "C & L" tires and tubes for the Chanslor & Lyon automobile supply concern, which has eight large branch stores on the coast. Fabric and cord casings will

H. SENN F. T. NEDBAL F. M. CARY

King Tire & Rubber Co. Officers

be made in the 30 by 3½ size, and all other sizes up to 36 by 6 will be in cords. S. I. Tustin will be in charge of the plant. The officers of the new company are: President, F. T. Nedbal; secretary, H. Senn; F. M. Cary, director.

L. M. Van Riper, general sales manager of the Racine Rubber Co., Racine, Wisconsin, has been a recent visitor to the coast.

The Northwest

Although in operation less than a year, the Occident Rubber Co., Beverly Park, near Everett, Washington, is planning for the immediate addition to its equipment of $25,000 worth of machinery. The concern makes no tires but does a considerable business in rubber mats, heels, soles, and other mechanicals. It was organized by Dr. H. H. Valentine, long a rubber chemist in eastern mills, and uses his exclusive formulas.

Non-skid cushion heels and tire repair materials are running strong, according to the Huntington Rubber Mills, 1580 Macadam street, Portland, Oregon, of which Harry Huntington is president and general manager. The company is extending its business not only farther south on the coast but east as far as Denver.

The Southwest

The Spreckels "Savage" Tire Co., San Diego, California, reports that more than one hundred tons of new machinery and additional tire-building equipment have been recently received at the company's factory, while other large shipments were soon to follow. Regular production continues unabated, while prospects for 1923 are excellent.

About 100,000 acres in Arizona have been planted to long staple Pima cotton, and the average yield per acre is figured at 200 lbs., in contrast with 225 lbs. per acre for short staple. Total 1923 production for the state is estimated as 42,000 bales. A largely increased yield of cotton is also figured on in Southern and Lower California. Some estimates for Imperial Valley place the 1923 output of cotton as double that of 1922. The bulk of the cotton of the Southwest will pass through the port of Los Angeles, where a new cotton compress to cost $65,000 and a new $50,000 warehouse of 50,000 bales' capacity will be erected before the summer.

The Rubber Trade in Great Britain

By Our Regular Correspondent

THE improvement in business generally hardly bears out the optimistic tone of the public utterances of business men or articles in the press. Perhaps there is too much tendency for a speaker or writer to lay stress on what has come under his particular observation, just as we read reports of the opulence or penury of the Germans from particular tourists. It may be taken that the rubber trade is not booming, though there is a much better showing in many branches than was the case two years ago.

Close Competition in Proofing Lines

A rather bad feature about business, especially in the proofing branch, is the close competition. The price of rubber is of course up and the existing competition has led to economy in the use of the best quality for goods which are not guaranteed. There is an increasing amount of unguaranteed proofing being done both in single and double texture, a fact which assuredly will not redound to the credit of the trade in the future, though it may answer its immediate purpose of bringing grist to the mill of the producer thereof.

Now that raw rubber has attained what was supposed to be the maximum price, *viz.*, 1*s.* 6*d*, per pound, aimed at by the Stevenson Committee regulations, manufacturers are naturally anxious lest this figure be exceeded. If it should turn out that the price soars higher, to the undoubted detriment of the trade, it may be taken for granted that the matter will become one of recriminatory party politics, much as is the case at present with regard to the free import of foreign tires. The report of the Rubber Growers' Association's deputation to America is being awaited with the greatest interest in the trade and no doubt it will receive due consideration in high political circles. At the moment the position points to a gradual expansion in the visible supply for the next few months, as rubber is not being taken up freely because of the recent heavy buying. It will be interesting to watch the effect when buying becomes vigorous again, though a runaway market is thought unlikely in well informed circles.

Institution of Rubber Industry

The annual dinner of the Manchester Section was held on February 24 and there was a good attendance. Alexander Johnston, managing director of the North British Rubber Co., Limited, and president of the institution, was in the chair and in reply to the toast of his health proposed by H. W. Hatton referred to his conversion from being an opponent of the institution to being a firm believer in its usefulness and possibilities. It had in it, he thought, all the qualities which were bound to make for success. Whatever success had been achieved during his term of office was almost entirely due to the fact that he had received the enthusiastic cooperation of every member of the council. Though Manchester was only a section it could not be denied that it was really the heart of the rubber manufacturing industry of the country.

J. H. Mandleberg, who responded to the toast of the Institution of Rubber Industry, referred specially to the great services which J. H. C. Brooking, the first president, had rendered in piloting the institution through its initial difficulties and bringing it into its present sound condition. In responding to the toast of the vice-presidents, proposed by T. H. Hewlett, D. F. L. Zorn referred to the great development in the use of latex, which was now finding a variety of applications. It had been noticed, he said, that a tremendous lot of latex had recently been sent to the United States—tank steamer loads, in fact. Now America was a prohibition country and a few weeks ago he had an inquiry from a British whiskey distiller asking for some latex for experiment. He asked them to put the two circumstances together, a request which caused much hilarity in the assemblage. The toast of the allied associations was given by Fordyce Jones and responded to in a vigorous and clever speech by John Haworth, secretary of the India Rubber Manufacturers' Association.

On February 19, at an ordinary meeting of the Manchester Section, J. H. Wild, of the Solvents Recovery Co., Limited, Mill Street Works, Pendleton, Manchester, read a long paper entitled "A Review of Solvent Recovery Processes," of which the portion relating to rubber waste solvents is here summarized.

Solvent Recovery

The author mentioned that quite a number of patents had been taken out for the purpose of recovering the naphtha used in spreading, but many of them had never had a practical trial because their inherent defects were obvious. He described five methods which had been tried and used to some extent, all depending upon drawing off the vapors by suction and condensation by water. He then referred to the system of absorption in oil and subsequent distillation of the naphtha from the oil. This system, he said, was now being used in a very large works which was in a position to provide for scientific supervision of the plant and also to carry out extensive research. The details of the plant were not public property, but creosote oil was understood to be the absorbent used. An American process in which the evaporated solvent is compressed and condensed in an atmosphere of flue gases in order to obviate the risk of fire and explosion was described as given in detail a year or two ago in THE INDIA RUBBER WORLD.[1] This process was said to be particularly applicable to the preparation of tire fabric, and is being used in America in connection with cord tires.

The author gave the fundamental requirements of a satisfactory recovery plant as follows:

1. A sufficient quantity of solvent must be recovered to show a substantial and constant profit after all expenses against the apparatus have been deducted.
2. The output of the spreading machine must not be reduced.
3. The possibility of fire must be no greater than in an uncovered machine and there should be no danger of an explosion.
4. The quality of the manufactured goods must be maintained.

These essentials, he claimed, were embodied in the apparatus called the "Voliq," manufactured by his firm, and he proceeded to describe it. The drying chests of the spreading machine are covered with a close-fitting hood at about the center of which is an exhaust box containing a fire screen of special design which can be easily withdrawn for cleaning. A pipe connects the exhaust box with an air circulator on top of a condenser, the base of which is connected to a reheater placed under the spreading machine. At the other end of the reheater a connecting duct conveys the recirculated air to each end of the hood. The solvent deposits in the base of the condenser, from whence it is removed by a pipe to a storage tank and is ready for use again. The whole apparatus is made of metal.

The apparatus has been practically tested in rubber works for four years. Taking an average recovery of nine gallons of naphtha per day the yield per year of 273 days would be 2,457 gallons per annum which, at 1*s.* 9*d.* per gallon equals £214.19.9. The amount net profit per apparatus after allowing for all charges was about £135. It should be noted that each spreading machine has its own complete apparatus, so in order to test the system it is not necessary to have the whole spreading room affected.

In the ensuing discussion H. L. Terry referred to the long use of a recovery plant at the card clothing works in Lancashire and

[1] THE INDIA RUBBER WORLD, June, 1920, p. 584.

Yorkshire. The vapors were drawn off and condensed in copper tubes in a tank of brine cooled down by ammonia refrigerating machinery. This machinery also served to freeze the blocks from which the fine cut sheet was obtained, so it served a double purpose. In an ordinary spreading works the economy of installing such a plant had not been demonstrated. Some 60 or 70 per cent of the solvent used was recovered and he would like to know what percentage was obtained in the Voliq plant.

Two or three speakers referred to the nature of the solvent recovered and a chemist present said that he had analyzed the vapors and the recovered naphtha and the distillation points were practically the same as in the case of the original naphtha. From the remarks of one speaker it seemed clear that the plant was giving satisfaction in his works. In his reply the author, referring to percentage of recovery, said it was difficult to give figures because the spreading machines dealt with such different classes of work but it might be anything from 40 to 60 per cent. Anyhow, the actual results obtained were the property of the several rubber works and it was not easy to get hold of them.

Reclaimed Rubber

Reports from this branch indicate that business is much better than it was a year ago, and no doubt the rise in price of raw rubber has had a good deal to do with the improvement. At the same time there is no very exact connection between the prices of the two commodities, each being bought on its own merits. In support of this statement, it may be said that a high-class brand of reclaim made in England was being sold at *2d* per pound higher price than new rubber, this being due to the fact that when manufacturers have used a certain reclaim and found it satisfactory they are very loath to alter the mixing.

The Rubber Regenerating Co., Limited, of Trufford Park, Manchester, are now working full time instead of three days a week as was the case about a year ago. Dr. Joseph Torrey, who has for so many years been the manager of the Northwestern Rubber Co., Limited, of Litherland, Liverpool, has left the company and returned to America, where he intends to reside permanently.

T. B. Burrows, who has for many years been the moving spirit of Somerville's Live Rubber Co., Limited, at Liverpool, has left the firm and started in business as a reclaimed rubber salesman.

The sole selling agency of the Northwesteren Rubber Co., Limited, reclaims is in the hands of Buckleton & Nourry, of Liverpool. It will be recalled that Captain E. E. Buckleton was for many years the selling representative of the company before he went into business on his own account. His firm also does business in other makes of reclaim besides the Northwestern.

Financial Notes

The suspension of payment of the Midland Rubber Co., Limited, an old established firm whose works are situated in Ryland street, Birmingham, has come as a surprise to a good many and it is also a somber reminder that though business is now on the mend some firms may not have been in the financial position to come through the crisis in such a way as to have sufficient resources left to go ahead at the present time. This business was founded more than thirty years ago, the present company, however, dating from 1911, when it was formed to take over the business of the existing company of the same name. The nominal capital is £80,000, the issued capital being £78,509, consisting of 24,833 cumulative preference, 14,000 A ordinary and 39,670 B ordinary shares, all of £1 denomination. In November, 1920, there was an issue of £50,000 debentures, and the bank interested in these has by request of the directors appointed C. H. Smith, chartered accountant, as receiver of the assets and manager of the business. The business will be carried on as usual and it is hoped that at the forthcoming meeting of the creditors a scheme for the reconstruction of the company will be submitted and carried.

A creditors' petition for the winding up of the Isleworth Rubber Co., Limited, which was a wartime promotion and has worked with satisfactory results, was recently before the courts. It was, however, adjourned, as it was shown that the company has valuable assets and that a scheme of arrangement with the creditors was under consideration. Both the petition and scheme will come before the court at a later date.

The Lancashire Rubber Works, Limited, of Pollard street, Manchester, is also a victim of the depression in trade, having been wound up and its property disposed of. This was only a small concern, the main business being the manufacture of rubber heel pads.

W. T. Henley's Telegraph Works Co., Limited, shows a net profit of £206,339 for 1922, against £224,739 for the preceding year, and the dividend remains at 15 per cent. It is stated that Henley's Tyre and Rubber had an improved year, but that the condition of the tire trade remains very unsatisfactory to British manufacturers.

The Rubber Trade in Europe

By Our Regular Correspondent

Germany

The indications are that the coming generation of Germans will include a large percentage of mathematical prodigies. Never was such juggling with huge sums. Imagine the calculation necessary to fill a good-sized order of jar-rings when these are 20,000 marks per kilogram (kilo=2.2 pounds), which would mean a cost price of about 80 marks a ring! Hardly less astounding is the present price of gas tubing, best quality red bringing 13,000 marks a kilo and the cheapest 7,200 marks. The cheapest kind of gray gas tubing costs 5,400 marks a kilo, which works out at about 550 marks a meter! A meter of half-inch water tubing is quoted at 2,100 marks, which amounts to 63,000 marks for a roll of thirty meters. For a red air-cushion one is asked to pay 7,500 marks and about the same for a hot-water bottle. Baby's nipple comes to 300 marks, to the dealer, and a yard of rubber sheeting averages 7,000 marks. And even these prices are not the utmost German manufacturers can work out, for the latest news is that new increases have been decided upon.

From February 4, 1923, the following additional charges will be effective: Seamless rubber goods, except preservatives, pessaries and operating finger stalls, 50,000 per cent; preservatives, pessaries and operating finger stalls, 40,000 per cent; catheters, goods of sheet rubber, hard rubber and mineralized rubber, 30,000 per cent; bathing caps, sponge bags and tobacco pouches, 25,000 per cent. Tires have an extra charge of 550 per cent for bicycle, motorcycle and vehicle tires; tubing for these, 600 per cent; automobile covers, 650 per cent; covers with steel rivets, solid tires, 700 per cent; automobile tubes, 800 per cent.

It has been suggested that the best thing for Germany, under the circumstances, would be to stabilize the mark. However, opinion is by no means unanimously in favor of such a proceeding, for it is held that stabilization would cause a slowing down of buying and result in stagnation of business. For it is a fact that each announcement of price increases is followed by almost furious buying. Of course, this is not quite as marked as it has been, and some factories have had to stop work or reduce the number of working hours (Hannover, Thüringia), owing to the high cost and scarcity of many raw materials, as rubber, cotton, benzol, fuel. Prices for manufactures are in many cases higher than the prevailing world-market prices. The cable industry is not in a particularly brilliant position and ordering is very slow.

Raincoat Styles

Rubberized clothing is one of the lines that has been taken up again very thoroughly here. Rubberized and rubber-impregnated coats, capes, hats, sport costumes with breeches, for men, women and children, are shown in a variety of styles. The favorite materials are impregnated all-wool cheviots with big checks; rub-

berized cashmeres of part wool and cotton, impregnated covercoatings, rubberized two-faced cloths. One style has the inside of an impregnated woolen cloth, while the outside is of impregnated gabardine. Raglan models are the most popular both for men and women. Another model for men, which is quite new, is of rubberized material and has an inverted pleat at the back, a two-piece belt and a hood that closes by means of a buckle. Rubberized and impregnated sport suits have single-breasted jackets, supplied with different kinds of pockets, two-piece belts and arrangements on the sleeves to protect the wearer against wind. With these jackets go rubberized or impregnated breeches with pockets and buckle-belt. These sets are very popular. Waterproof hats to match complete the costume.

Raincoats for women offer more variety, although the most popular styles generally have raglan sleeves and are roomy; next to these are the bloused models. The trimming generally consists of leather-piping, banding, belts. Even hoods are made of this material. Narrow leather belts are also drawn through the collars. Buttons, of course, are a favorite form of decoration, and sometimes buttons of enormous size are used. Rubberized or impregnated suits, consisting of jacket and breeches, fastening at the knee, are popular with the women for motorcycle riding and general sports wear. As a rule hoods, or caps on the style of hoods, are preferred for use with raincoats. Sailor hats of rubberized materials are being superseded by leather hats.

One of the foremost makers of rubberized clothing is the well-known Continental Caoutchouc und Gutta Percha Compagnie, Hanover.

New Toys

The Gummiwarenfabrik Curt Schellbach, Seiferitz-Meerane, in Saxony, keeps adding to its rubber novelties. The latest is the so-called Devil's ball, which begins with a moon-faced, squint-eyed, properly bewhiskered and horned devil's head on top of a particularly helpless and humble upper body which terminates in a beautiful, round ball instead of the usual pair of legs. Tongue balls and squirting revolvers are old and so is the ball filled with sponge rubber. But a 7½-inch rubber ball that can be carried in one's vest pocket sounds new. And as a toy, the rubber dagger lately advertised is also recent and will probably make a hit. This firm also makes a number of miniature rubber articles for dolls, including, besides the well-known nipples, rubber bathing caps for dolls.

New Method of Fire Prevention

"Cellon" is the name of a chemically prepared liquid, manufactured by the Cellon-Werke, Charlottenburg, which it is claimed renders any webbing, fiber, paper, cardboard and even soft wood articles non-inflammable when impregnated with it. Not only this, but heat causes it to throw off gases which choke any incipient fires. It is colorless, practically invisible, and does not cause materials on which it is used to deteriorate. An unlimited number of ways for utilizing it suggest themselves. In the factory the clothes of workers could be protected; airplane cloth treated with it would make aviation much safer; valuable papers, plans, drawings, fabrics, etc., could thus be safeguarded.

Italy

In a German paper there recently appeared an article by Dr. Tullio Guido Levi, of Milan, on the Italian rubber industry. The rubber industry in Italy may be said to have started fifty years ago, when the engineer, G. B. Pirelli, opened a small workshop. This firm has developed into one of the world's foremost rubber manufacturers and now has a capital of 120,000,000 lire and employs, altogether, about 10,000 workers.

Other rubber concerns in Italy are of comparatively recent date. All kinds of rubber goods, excepting rubber footwear, are manufactured here. At one time rubber toys, too, were turned out, but at present these are not locally made, because of obligations toward German factories. Altogether the Italian rubber industry gives work to about 20,000 hands, mostly in the north of the country. Milan and Turin are the headquarters for the large factories; Genoa, Florence, Leghorn and Naples are the centers for the smaller works. The greater part of the exports, about 75 per cent in fact, consists of tires.

Before the war Germany played an important part as exporter of rubber manufactures to Italy and serious efforts are being made to regain this position. That success is attending these endeavors may be noted from the increasing amount of rubber goods imported by Italy from Germany.

The Russian Rubber Industry

An official Soviet publication of June, 1922, reviews the Russian rubber industry during 1921. Altogether only four rubber factories worked during the year, namely: No. 1, formerly the Treugolnik; No. 2, formerly Bogatyre; No. 3, formerly Kautschuk, and No. 6, formerly Prowodnik (in Peresslawe-Salessk). Of the other two, No. 4 had not yet been completed, while No. 5 in Tuschina, near Moscow, could not be supplied with fuel, owing to its unfavorable situation. Supplies of raw rubber were not enough to allow all the factories to work to capacity.

The number of persons employed in the Russian rubber industry increased from 6,501 in 1920 to 7,100 on the first of January, 1921, and to 8,430 on the first of July, 1921. There is a great shortage of skilled workers, as well as of medium and high-grade technical men.

None of the factories worked continuously, owing to fuel shortage. Lack of food was another obstacle. Nevertheless, despite adverse conditions, the average output per workman per day was 0.027 pood of raw rubber, while in some cases the rate was not below that of pre-war days. Difficulties in the matter of transportation caused goods to move very slowly.

The production of 1921, as compared with 1920, follows below:

	1920				1921		
	First half year		Second half year		First quarter		1st Half year
Unit	1,000 units	Per cent	1,000 units	Per cent	1,000 units	Per cent	1,000 units
Rubber footwear...*pairs*	...	...	10.2	8.1	103.8	85.5	125.2
Automobile tires, tubes and repair....*number*	31.1	90.0	34.5	100	16.6	48.0	34.5
Belts ....*arshine, inches*	146.9	49.5	292.7	98.6	131.7	44.4	296.8
Rubber tubes, hose, *arshine, inches*	46.1	117.9	60.6	155	17.8	45.5	39.1
Special tubes.....*number*	....	....	....	....	7.6	67.8	11.2
Technical goods.....*pood*	3.9	130	4.5	150	1.7	56.6	3
Sole sheets.....*pood*	12.6	81.8	62	402.6	6.6	42.8	15.4
Surgical goods...*number*	223.7	28.4	1287.4	163.6	305.5	38.8	786.6
Technical plates.....*pood*	....	....	....	....	4.4	96.2	5.1
Sole plates from automobile tires.....*pood*	....	....	....	....	0.25	22.7	1.1
Articles of ebonite..*pood*	0.6	42.6	1.5	107.1	0.8	57.1	1.4
Accumulator reservoirs, *number*	51.6	206.4	....	....	14.9	59.6	25
Rubberized material, *square arshine*	0.05	0.06	0.04	0.05	48.1	67.0	71.7
Asbestos goods.....*pood*	9.3	155	14.3	283.3	0.3	5	6
Packing .....*pood*	6.5	361	4.4	244.4	0.5	27.7	1.8

In the above, the figures for the first half of 1921 form the basis of calculation of the percentages during the other periods. A pood equals 36 pounds avoirdupois; an arshine is equal to 28 inches.

The decrease in output during 1921 was due to closing down of works, owing to shortage of fuel. Only in the case of technical plates was it possible to exceed the amount called for in the program. There was sufficient raw material on hand left over from stocks held before the revolution; but in regard to rubber, up to 1921 the factories had to make use of old rubber. However, by July, 1921, there was on hand 90,000 pood of raw rubber imported from abroad.

From another Russian source it is learned that since then the situation has improved. The shortage of fuel is still the great drawback to increasing activity. However, since this seems to be caused by lack of facilities to transport the fuel, rather than to inability to procure it, and as locomotives are being imported from Germany and Sweden and some are even being built at the recently reopened Neva works at Petrograd, this problem will soon be solved. Progress has been made in the repairing of the Moscow-Petrograd railway line and the reopening of the harbor, so that rapid advancement also in the rubber industry here may be looked for in the near future.

Meanwhile, during December, 1922, the daily output of rubber footwear at the Treugolnik (No. 1) was 30,000 pairs and at the Bogatyre (No. 2), 26,000 pairs. This is more than half the prewar output. The factories have enough rubber for four or five months. Recently 125,000 pood of rubber were imported from England. It is said that attempts to bring up rubber that was sunk in the harbor of Archangel during the war have been successful and the rubber is offered at London prices. It appears from the reports that the rubber has not suffered from its submersion.

Besides telling of the 40 per cent increase in output of rubber goods during December, as compared with November, the Russian economic press says that the finish of surgical rubber goods nas vastly improved at No. 3 (Kautschuk), while No. 4 (Prowodnik) has undertaken the making of impregnated materials.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

THE present outstanding facts are that restriction is working better than ever its warmest advocates expected. Prices are holding firm and to almost everyone's surprise the American bogey seems to be fast disappearing. And for all this, credit is due that champion of restriction, *The Straits Times*, which, let it be added, is patting itself on the back in an audible manner. But success has not bred arrogance and *The Times* feels charitably disposed toward almost everyone, including certain American rubber manufacturers who are prominent in a campaign against the Stevenson Act, and in favor of extensive American plantations in the Philippines and South America. But our contemporary explains good-naturedly that rubber does not grow like cabbage but takes something like six years to mature, while the restriction scheme is expected to achieve its purpose inside of twelve months.

There is much doubt here about the possibilities of growing rubber in the Philippines on an extensive scale. The Philippines have been in the possession of Americans for a relatively long time as compared with the age of the modern rubber planting industry, therefore there must be a very good reason why the astute Americans have not yet developed the rubber industry there on a large scale but have preferred to invest big sums of money elsewhere.

Letters like that recently published in a local paper only tend to strengthen this argument. The writer of the letter in question was offered four years ago the administration of a large American concern with enormous capital to cultivate rubber in the Philippines. He investigated matters on the spot and decided that he did not like the job, as several large and expensive attempts to produce rubber here have practically ended in failure. Finally the writer declares that it will take thirty years and rubber at 5*s*. a pound to make rubber pay here under the conditions existing four years ago.

Altogether, therefore, the tendency here is to take American threats lightly. There is a certain humor in the situation. Not so long ago planters were skimping and losing money to the tune of the slogan, "The market is glutted with surplus rubber," while the manufacturers, especially American, played cat and mouse with the market. Now the tables are turned; the Americans are crying scarcity and producers are looking forward to the pleasure of dictating terms to the American manufacturer.

It is predicted that the importance of America as a consumer of rubber has reached the climax; that America's ability to absorb rubber has reached saturation point and is about to dwindle.

Producers are so pleased with restriction (all but the die-hards), that they wish to have the restriction enactment kept on the statute books forever, so that whenever occasion should require, we could brush it up a bit and use it again.

The Small Holder

The case of the small holder has been carefully investigated and it has been found that most of the opposition to restriction was due to ignorance; some to deliberate misrepresentation; while the rest came from would-be clever people who wished to be exempted. Nevertheless, the small native holder had a real grievance against the methods of the dealers, mostly Chinese, who buy up their product. These dealers paid ridiculously low prices and cheated the producer by buying wet rubber with full weight coupons, so that the seller lost money on account of unfair weight and then he could not produce as much as he was really allotted.

In a certain district, all this has been straightened out; a new standard grade has been established called "Kampong standard"; the daily Singapore price is to be posted and on this local prices will be based according to grade.

Forging Coupons and Hoarding

It was clear from the start that all kinds of tricks would be tried to evade restriction or to turn it to account in a way not intended. Recently, the first case of forging of rubber export coupons came up in the court of Penang. Two Chinese were the culprits. They had evidently planned to carry on their little trade on a large scale, and hundreds of coupons were found on their premises. These coupons were obvious forgeries, the coloring was bad and the patterns were wrong.

Much has been said and written about the dangers of hoarding, and apparently the government considers them to be very real, for notice has been given that legislation is being prepared to deal with hoarding, and with buying and selling locally without coupons. After the first of January, 1923, licensed dealers in rubber will be required to furnish monthly returns of the stock of rubber and export licenses or coupons in their possession. On May 1, 1923, a census of all rubber in the possession of producers will be taken.

Rubber Restriction Statistics

Officially it has been reported that the standard production of the Straits Settlements, excluding the Islands of Singapore and Penang, as assessed under rules 34 to 37, is as follows:

	Holdings of 100 acres and under Pounds	Holdings of 100 acres and over Pounds	Totals Pounds
Penang	5,994,542	13,680,333	19,674,875
Malacca	14,982,755	38,444,520	53,427,275
Totals	20,977,697	52,124,853	73,102,150

These figures are not final, as inspection of holdings is still being carried out.

Licensed dealers' stocks were allowed to be exported under Rule 17 and a concession was made later to small holders, allowing the export of their stocks subject to a rate of 10 catties per acre of the holding and a maximum of one picul.

The amount of stocks thus licensed for export in the colony is:

	Pounds
Dealers' stocks	3,602,241
Small holders' stocks	347,220
Total	3,949,461

The quantity of rubber produced in the colony which passed through the export duty office was as follows:

	November Pounds	December Pounds	Totals Pounds
Penang	542,186	860,938	1,403,124
Malacca	1,907,844	2,844,825	4,752,669
Totals	2,450,030	3,705,763	6,155,793

For the rest of Malaya the figures are the following:

	November Pounds	December Pounds	Totals Pounds
Federated Malay States	11,119,472	15,657,837	26,777,309
Johor	4,293,408	5,335,600	9,627,008
Kedah	1,291,100	2,110,633	3,401,733
Kelantan	364,022	588,414	952,436
Trengganu	62,359	60,512	122,871
Totals	17,130,361	23,750,996	40,881,357

Forward Contracts

The following scheme has been approved by the government of the Straits Settlements to grant relief in certain cases where forward contracts for the sale of rubber have been made.

1. No relief will be granted where: (a) the forward contract was made after October 11, 1922; (b) the price in the forward contract, or the average price in contracts, is 45 cents (Straits currency) a pound or over; (c) the forward contract in a quarter amounts to less than half the allowance for that quarter.

2. Where the forward contracts in any quarter exceed half the allowance for that quarter, compensation will be paid on the difference at the rate of the difference between the contract price and 45 cents per pound. For instance, a company has an allowance of 60,000 pounds for a quarter. It has a forward contract of 40,000 pounds at 25 cents a pound. Compensation will be paid on the 10,000 pounds at the rate of 20 cents a pound.

3. For the first quarter 45 cents is fixed as the price up to which compensation will be paid.

4. The above scheme applies only to forward contracts in which rubber has been sold for money.

Ceylon

Your true zealot is the converted man. In pre-restriction days, the Ceylon planter made it pretty clear that he would have nothing to do with restriction, and when voluntary restriction was requested by the Rubber Growers' Association the response from Ceylon was so poor that it had to be abandoned. When enforced restriction was mentioned, there was much opposition and it is certain that had the scheme which was finally introduced been accompanied with different instructions, Ceylon would have strenuously opposed it.

However, the scheme has met with approval and now that prices are rising and the values of shares are going up, the great majority of producers feel that it is making good and are perfectly satisfied with it. So much so that agitators against it get no sympathy at all here and the antics of the British and American manufacturers are, painful to relate, regarded with much amusement. It tickles the risibilities of the local planter to learn after only three months of restriction that the huge surplus stocks that were supposed to be the cause of the low prices have suddenly vanished and that a threatening shortage has taken its place.

As for threats about planting in the Philippines, the Ceylon planter refuses to be impressed. Such plans take time to mature and in the meantime there will be the serious shortage to cope with. So, to use a popular American expression, "he should worry." On the other hand, of course, if the manufacturer is sensible enough to come to terms with the planter, he will get fair treatment.

Exportation of Latex

While in Malaya it was decided not to exempt latex from the provisions of the restriction ordinance, in Ceylon the preponderating opinion is that latex should be free, and up to the present no ruling to the contrary has been announced.

The Rubber Restriction Advisory Board has submitted to the Ceylon government a detailed statement of the reasons why rubber latex should continue to be excluded from the provisions of the restriction ordinance. At present very little fluid rubber is exported from Ceylon,—in November 953 gallons and in December 1,088 gallons were shipped from here,—but very large quantities are being shipped regularly from Sumatra direct to America and it is thought that as rubber in the form of latex may have a very material effect upon the future of the industry, the question is one of great importance.

Concerning other debatable points in the restriction rules, it is learned that with reference to the basis of calculating restriction, the London Committee has, in reply to local representations, decided that the output given in the much-berated Duncan scale should be adhered to.

Furthermore, the question whether manufactured rubber articles should be excluded from the operation of the ordinance has received much attention. At present the Federated Malay States ordinance exempts completely manufactured rubber goods, but the Straits Settlements and the Ceylon ordinances do not. There is a strong feeling in the last two countries that such goods should be exempted.

Netherlands East Indies

Apparently the Dutch are going to take up the study of rubber latex in their usual thorough-going manner. The foremost rubber scientists are giving latex their attention and all available data concerning it are being collected.

Dr. O. DeVries, director of the Central Rubber Station, Buitenzorg, has written a pamphlet on the shipment of latex, from which the following has been taken.

In the Dutch colonies, Deli, Sumatra, leads in latex shipments. In 1921, 52 tons of latex were exported, and in the first 7 months of 1922, 336 tons. Reports from Malaya received at the station say that recently an order for 3,000 tons of latex was put in!

As yet not much latex is being sent from Java. One trial order of 9,000 liters and others of about 700 and 200 liters are known of. The Central Station itself sent, upon request, several small parcels to rubber chemists and others interested in latex.

Discussing the anti-coagulant, ammonia, it is pointed out that the grades usually sold are the following: specific gravity, 0.96—ammonia (NH_3) content 10 per cent; specific gravity 0.93—ammonia content 18½ per cent; specific gravity 0.925—ammonia content 18½ per cent; specific gravity 0.90—ammonia content 28 per cent.

For the present it is advised to add 2 per cent of so-called 0.93 ammonia to the latex. Experiments in the laboratory show that possibly 1½ per cent may be sufficient. A trial shipment has been sent with this amount of ammonia, but as yet no report of results has come to hand.

The addition of ammonia raises the costs about 6 to 15 gilder cents per kilo of rubber. The packing too is more expensive than for sheet or crêpe; in fact this is 6 cents per kilo against 2½ to 4 cents per kilo. Freight rates make the difference still greater, for at present the tariff for latex to Europe is the same per cubic meter as for dry rubber, which makes costs on that head three times as high. On the other hand there is a saving of 3 to 5 cents a kilo on preparation (labor, utensils, fuel, etc.), while with regular shipments of latex it would be possible to save a few cents per kilo on upkeep and writing-off of machinery.

While most rubber scientists see a good future for latex, it is curious to note that F. C. van Heurn, formerly connected with

the experiment station of the East Coast of Sumatra Rubber Producers' Association, takes the opposite view. He sees in rubber latex only a whim of some eccentric importers. The extra costs of sending latex, which he works out at 14 cents per kilo, would not make it profitable.

In Dr. DeVries' paper some data about the shipment of slab rubber and similar "ripened" rubbers are given. At present the Central Station is cooperating on an order for 2½ tons of slab rubber for Germany and 5 tons for America, besides a small trial shipment of three kinds of ripened rubber for an American factory. Two New York dealers and three rubber factories are willing to enter negotiations with estates over the delivery of slab rubber.

Special agreements regarding the moisture content enter into the contract. Some buyers stipulate a minimum of 14 per cent moisture with settlement in case of higher content, but none in the reverse case. Others buy on a basis of 24 per cent moisture and settle according to the dry weight found at the factory.

From Malaya, the station learns that several trial shipments of Sipef rubber (crêpe made of ripened rubber) have been made. Mr. Schrieke in his report talks of a monthly export of 10 tons. From Singapore it was heard that 225 tons of slab were delivered, and inquiries came in concerning 1,000 tons more. It seems, therefore, that interest in ripened rubber is growing, if slowly.

Hevea Latex an Excretory Product

In the *Archief voor de Rubber-cultuur* of December, 1922, Dr. W. Bobilioff deals with physiological significance of caoutchouc occurring in the latex vessels of *Hevea brasiliensis*.

The formation of rubber in Hevea under various conditions was examined. Comparative tests were made on the formation of rubber with and without light and also with a deficiency of reserve materials, and it was found that the exclusion of light and the removal of reserve materials caused an increase in the rubber content. Therefore, the rubber in the latex vessels must be considered an excretory product that originates as a by- or end-product of definite physiological nutritional processes of the plant. The latex vessels are in this connection repositories of excretory materials.

The Vultex Process

Rubber Cured in the Latex for Direct Use in Manufacture

Several patents have been granted in America and England relating to the direct utilization of rubber latex. These methods are interesting because they not only revolutionize the long established processes of obtaining and utilizing crude rubber but result in important cost reduction. They also make practicable many new possibilities in extending the application of rubber to new uses. The processes that relate to the vulcanization of rubber in its latex are perhaps the most remarkable. Among these may be mentioned those by Edward M. Slocum, Medan, Sumatra, and Philip Schidrowitz, London, England. The former invented an apparatus and process to coagulate latex under pressure in a specially partitioned chamber and added to it a vulcanizing agent[1]. He also patented the addition of an enzyme to latex adapted to react with it, and a vulcanizing agent added to the mass thus treated[2].

The latest patent dealing with rubber latex in a manufacturing way is that of Philip Schidrowitz[3]. The process is called the Vultex process and covers a commercially workable method whereby vulcanized rubber can be produced in the latex, or it may be coagulated and separated from the latex after vulcanization and in this state can be subsequently milled, sheeted and molded for the manufacture of solid articles.

[1]United States patent No. 1,268,638.
[2]United States patent No. 1,268,639.
[3]United States patent No. 1,443,149.

Schidrowitz Method

In the patent above-mentioned Dr. Schidrowitz states that rubber latex may be vulcanized while in substantially uncoagulated state so as to obtain an aqueous fluid preparation of vulcanized rubber which possesses several advantages.

To preclude coagulation during vulcanization the latex may be rendered definitely alkaline or basic before treatment, although it appears feasible to vulcanize fresh latex without rendering it alkaline artificially.

The alkaline preservative agent may be added as ammonia or in the form of an alkaline polysulphide. Compounding materials such as fillers, pigments, dyes, etc., may be added at any stage of the process, and the latex may be diluted with water subsequent to vulcanization.

Substantially no coagulation occurs on vulcanization of the latex, the bulk of the rubber remaining in solution or colloidal suspension in a vulcanized form, as has been proved by chemical and physical tests. The vulcanized fluid may be separated from any undissolved matter and is then ready for use, and will keep for a considerable time.

Process Exemplified

An example of latex vulcanizing, cited by the inventor, is as follows: 1.6 cc. of ammonia, 0.88 specific gravity, are added to 100 cc. of latex, containing about 30 per cent of rubber, and then a thin cream consisting of three grams of sulphur, one gram of zinc oxide and one cc. of piperidine in 35 cc. of water, the latter just made alkaline with one to two drops of ammonia, is placed in a vulcanizer and vulcanized, allowing half an hour to rise to 40 pounds, and half an hour at 40 pounds.

After vulcanizing, the liquid is strained through cloth or in some other convenient manner. The rubber may be separated from the strained solution either by evaporation or by coagulation, followed by washing and drying by any desired method.

Coagulation of the vulcanized product may be effected by the addition of an acid such as acetic or sulphuric and allowing the mixture to stand for some hours until complete coagulation has been effected. The coagulum is then separated, washed and dried in the usual way.

Advantages of the Process

In the preparation of rubber compositions by this method the danger of fire and the toxic effects associated with the usual rubber solvents are avoided. These advantages apply not only to the process of manufacture of the composition but also to the application of the vulcanized latex. These vulcanized latex preparations are considerably less viscous, and consequently contain a larger amount of rubber for the same degree of viscosity than the vulcanized or unvulcanized rubber solutions hitherto prepared.

The process is particularly valuable in connection with proofing. In this connection it is only necessary to employ operations of the simplest character. Fabrics so flimsy as not to admit handling on the spreading machine, except with special care, may be proofed without difficulty. Open-work nets with one-eighth mesh have been proofed and the rubber made to enclose the network squares.

This process would seem to have great possibilities of utility for very cheap proofings, in dipped goods manufacture and in rubberizing cords for making cord tires.

F. M. S. WATER POWER PROJECT

Trong Power, Limited, is a syndicate capitalized at 80,000 $1/-Str. shares, to develop the water power of the Trong River at Trong, Perak, under government grant. With cheap power, labor, crude rubber, and state assistance, this project offers unusual advantages for a rubber factory. C. E. Cumming, Ipoh, Perak, F. M. S., desires to interest capital in this development.

Recent Patents Relating to Rubber

The United States

Issued* February 6, 1923

NO. 1,444,061 Preserving uncured rubber. H. J. Butler, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.
1,444,070 Cord tire fabric. F. C. Hall, assignor to Jenckes Spinning Co.—both in Pawtucket, R. I.
1,444,076 Strain resisting element for rubber articles. A. E. Jury, Newark, N. J., assignor by mesne assignments, to Morgan & Wright, Detroit, Mich.
1,444,123 Tire construction. O. J. Humphrey, Elyria, Ohio.
1,444,152 Tire gage. A. E. Hahn, Sioux City, Ia.
1,444,157 Pneumatic load carrier. F. L. Lee, Spokane, Wash.
1,444,215 Boot with rubber or rubberoid knee. P. Y. Smiley, Kitchener, Que., Canada.
1,444,265 Cushioning tire. G. Orbin, assignor of ½ to O. J. Quinn—both of Tuscaloosa, Ala.
1,444,274 Rubber composition floor strip. S. G. Rigdon, Akron, Ohio.
1,444,391 Decorated elastic strip. E. T. Rosso, Columbus, Ohio.
1,444,487 Collapsible bathtub. E. Volters, St. Louis, Mo.
1,444,500 Resilient heel lift. F. J. Gleason, Cambridge, assignor of ½ to M. Brown, Boston—both in Mass.
1,444,501 Can rubber. F. E. Hannula and W. E. Trombley, Lansing, Mich.
1,444,533 Pneumatic tire casing. G. H. Witsaman, Dayton, assignor of ½ to A. Bernstein, Cincinnati—both in Ohio.
1,444,579 Blow out patch. R. H. Berkley, assignor to Whiting & Davis Co.—both of Plainville, Mass.
1,444,653 Tire rim. E. Boyce, Pine Bluff, Ark.
1,444,706 Single tube tire. F. Rosete, Tulcaningo Hidalgo, Mexico.

Issued* February 13, 1923

1,444,785 Armored tire. H. S. Esch, New York City.
1,444,814 Tire armor. C. F. Tucker, Kansas City, Mo.
1,444,892 Filler for tire casings. H. G. and L. B. Westgate, Union, N. Y.
1,445,008 Flexible inflation conduit for tires. G. F. Deady, assignor, by direct and mesne assignments, to The Dayton Disc Wheel Co.—both of Dayton, Ohio.
1,445,010 Breathing apparatus for swimmers. W. S. Feinberg, Chicago, Ill.
1,445,014 Cushion tire structure. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.
1,445,043 Pneumatic tire pressure gage and signal. W. G. and O. Sampson, Hansen, Idaho.
1,445,224 Life buoy. H. E. Long, Wellington, New Zealand.
1,445,274 Skirt belt. H. L. Greenberg, Portland, Me.
1,445,312 Combined raincoat and cape. A. P. Handler, St. Louis, Mo.
1,445,424 Airship and the like. R. H. Upson, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.
1,445,443 Tire flap. A. L. and E. H. Leeth, Washington, D. C.
1,445,465 Blow out boot. G. G. Williams, assignor to Fowler Williams Co.—both of Dallas, Tex.
1,445,466 Rim for pneumatic or solid tires. C. C. Wood, Wichita, Kans.
1,445,501 Hot water bag. H. F. Dwinall, Highland Mills, N. Y.
1,445,528 Armlet purse. W. B. Marsh, Brooklyn, N. Y.
1,445,533 Vulcanizing apparatus. T. Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.
1,445,540 Overshoe for tire casings. B. J. Mullikin, St. Louis, Mo.
1,445,606 Inner liner for tires. G. W. Stewart, Alameda, Calif.

Issued* February 20, 1923

1,445,768 Resilient tire. E. G. Hulse, assignor to Kelly-Springfield Tire Co.—both of Cumberland, Md.
1,445,840 Girdle. A. A. C. Malcolm, Brookline, Mass.
1,445,878 Balloon. H. W. Faber, St. Louis, Mo.
1,445,900 Fountain pen. R. S. McKay, Dunellen, N. J.
1,445,926 Demountable tire rim. J. W. Akard, Fair Play, Mo.
1,446,099 Life saving belt and the like. H. Marks, Chicago, Ill.
1,446,165 Tire. H. J. Doughty, Providence, R. I., assignor to Doughty Tire Co., Portland, Me. (Original application divided.)
1,446,197 Pneumatic wheel. J. Martin, Knocklong, Ireland.
1,446,206 Antipuncture device for pneumatic tires. C. Ortiz, Mendoza, Argentina.
1,446,222 Swimmer's float. L. A. Swineford, Ashland, Ohio.
1,446,289 Mat for sound recording and reproducing machines. M. M. Dessau, London, England.
1,446,290 Air bed, cushion, and the like. M. M. Dessau, London, England.
1,446,420 Rubber scraping device. J. M. Goubier, Aulnay sur Mauldre, France.

Issued* February 27, 1923

1,446,466 Sponge rubber toy. W. H. Huth, Chicago, Ill.
1,446,524 Fountain pen. I. D. Tefft, assignor to The Wahl Co.—both of Chicago, Ill.
1,446,641 Captive playing ball. C. F. Craig, San Francisco, Calif., assignor to Craig Golfmeter Co., Wilmington, Del.
1,446,644 Inner tube for pneumatic tires. E. G. Eschenfelder, Waterloo, Ill.
1,446,705 Demountable rim. R. Houser, Centerville, Ia.
1,446,915 Inner tube. H. A. Longshore, assignor to N. G. Warth—both of Columbus, Ohio.
1,446,922 Resilient wheel. A. L. Morse, Arlington, Mass.
1,446,928 Brassiere. H. L. Redmond, Boston, assignor to The Williams Carter Co., Needham Heights—both in Mass.
1,447,009 Punctureproof tire. H. Behrens, Quinter, Kans.
1,447,100 Brake lining. W. D. Pardoe, Trenton, assignor to Thermoid Rubber Co., Hamilton Township—both in N. J.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Granted January 16, 1923

227,916 Tire protector and cushion. E. M. Beckman, Gary, Ind., U. S. A.
227,924 Quick detachable cap for valve stems. A. E. Bronson, Cleveland, Ohio, U. S. A.
227,944 Rubber sole and heel. S. C. J. Gill, Winlaw, British Columbia.
227,950 Elastic cement. W. T. Goddard, Hamilton, Ont.
227,992 Tire. T. T. Overshiner, Louisville, Ky., U. S. A.
227,999 Tire rim. J. R. Place, Grand Junction, Mich., U. S. A.
228,008 Traction tread. O. S. Schiefele, Conestogo, Ont.
228,017 Tire. H. H. Swan, Grand Rapids, Mich., U. S. A.
228,030 Tire. J. H. Williams, Gilbert, Alberta.

Granted January 23, 1923

228,219 Tire valve. H. R. Taskey, Yorkton, Sask.
228,264 Cushion tire. The B. F. Goodrich Co., New York City, assignee of J. R. Gammeter, Akron, O.—both in the U. S. A.

Granted February 6, 1923

228,504 Hose support. C. J. Hazelton, Worcester, Mass., U. S. A.
228,553 Rubber hose supporter button. The American Narrow Fabric Co., assignee of C. J. Hazelton—both of Worcester, Mass., U. S. A.
228,554 Rubber or rubberoid knee boot. The Ames Holden McCready, Limited, Montreal, Que., assignee of P. Y. Smiley, Kitchener, Ont.
228,560 Heavy truck tire flap. The Canadian Consolidated Rubber Co., Montreal, Que., assignee of A. O. Abbott, Jr., Detroit, Mich., U. S. A.
228,564 Means of packing tires. The Dunlop Rubber Co., Limited, Regent's Park, London, assignee of G. F. C. Powell, Birmingham, Warwick—both in England.
228,619 Collapsible tire rim. H. Swerdlow, assignee of J. H. Howles—both of New York City, U. S. A.

Granted February 13, 1923

228,718 Closure. The Anchor Cap and Closure Corporation, Long Island City, assignee of W. P. White, Brooklyn—both in New York, U. S. A.
228,740 Dust cap. A. Schrader's Son, Inc., assignee of M. C. Schweinert—both of New York City, U. S. A.
228,741 Inflating coupling. A. Schrader's Son, Inc., New York City, assignee of H. P. Kraft, Ridgewood, N. J.—both in the U. S. A.

The United Kingdom

Published February 7, 1923

190,326 Armored tire. M. Golein, 222 56th street, Brooklyn, N. Y., U. S. A.
190,358 Rubber flooring and paving tiles. H. B. Rogers, 5 Princes street, Hanover Square, London.
190,363 Rubber padded horseshoe. E. R. Spencer, 45 Southfield Square, Bradford, Yorkshire.
190,398 Cushion sole. International Exchange & Banking Corporation, Limited, 10 Jermyn street, and A. Rollo, 58 Stangate Buildings, Lambeth—both in London.
190,436 Waterproof hat. Radium-Gummiwerke, Dellbruck, Cologne, Germany. (Not yet accepted.)
190,515 Elastic leg bandage. F. G. Chamberlain, The Moyse, Horsham street, Faith, Norfolk.
190,530 Toy balloons. E. C. R. Marks, 57 Lincoln's Inn Fields, London; B. B. Keith, Mansfield, Ohio, U. S. A.
190,621 Race games. S. C. Nagle, 167 Lowther Mansions, Barnes, London.
190,645 Breathing bags. A. B. Drager, Finkenberg, Lubeck, Germany.
190,647 Surgical truss. F. M. Back, 11 Walkerville Terrace, Gilberton, South Australia.
190,677 Rubber sole. W. Thomas, 23 Bendrick Road, Barry, Glamorgan.

Published February 14, 1923

190,880 Equipment for carrying purposes. F. E. Hodges, 32 Robertson Road, Easton, Bristol.
190,933 Rubber mud guard for vehicle wheels. J. H. Kay, Lanehead, Rochdale.
190,938 Armored tire. T. H. Rushton, The Grove, Chester Road, Erdington, Birmingham.
190,954 Rubber stopper. A. J. V. McDonnell, 39 Stamford Hill, London.
190,960 Detachable heel pad. G. Bormann, 33 Wallbrechtstrasse, Hannover, Germany.
190,973 Device for pressing a cemented split portion of a sole against a heel breast. E. W. Wood, 250 Emerson Place, New York, U. S. A.

Chemical Patents will be found on page 431, Machinery and Process Patents on pages 433-435

Published February 21, 1923

191,109 Valve patch for tires. Dunlop Rubber Co., Limited, 1 Albany street, Regent's Park, London, and C. Macbeth, Fort Dunlop, Erdington, Birmingham.

191,142 Reservoir pens. E. Narayan, 229 Boulevard Péreire, Paris, France.

191,143 Electric repair vulcanizer. W. Frost and H. Frost & Co., Limited, 148 Great Portland street, London.

191,229 Rubber mats for floors. T. N. Cooper, 102 Park street, Birmingham.

191,250 Corrugated rubber cement counter pad for boots and shoes. J. F. Storey, 164 Aldersgate street, London.

Published February 28, 1923

191,310 Footballs. H. Verry, 16 Tower street, Kings' Lynn, Norfolk.

191,320 Cushion tire. A. E. White, 88 Chancery Lane, London; International Overman Tire Corporation, 109 Broad street, New York City, U. S. A.

191,345 Pneumatic tire provided with inflated rubber balls. Standard Rubber Works Proprietary, Limited, Judd street, Richmond, near Melbourne, Australia.

191,375 Tire rim. J. Tap, 18 Rue Pons, Toulouse, France.

191,459 Cushions for chairs, etc. Fuller's United Electric Works, Limited, and L. Fuller, Woodland Works, Grove Road, Chadwell Heath, Essex.

191,492 Garter with rubber button. E. A. Lillie, Onaway, Knighton Rise, Leicester.

191,499 Rubber-lined teat cups for cow-milkers. J. Trelcar, Hamilton, New Zealand.

191,504 India rubber heel rest for automobiles. W. H. Bishop, 12 Corporation Road, Dudley, Worcestershire.

191,508 Tires. V. Brown, 38 South Meadow Lane, Preston.

Germany

Design Patents Issued, with Dates of Issue

834,935 (March 18, 1922) Heel patch of rubber. Mittelland Gummiwerke A.-G., Hannover-Linden.

835,126 (December 13, 1922) Tread for pneumatic tires. Aviauto Kraftwagen und Flugzeugmaterial G. m. b. H., Vienna, represented by Dr. W. Friedrich, Berlin-Lankwitz.

835,450 (December 18, 1922) Teething ring. Traugott Weiss, Schmiedeberg im Riesengebirge.

835,537 (December 15, 1922) Non-skid sole and heel. Felten & Guilleaume Carlswerk A.-G., Köln-Mülheim.

835,538 (December 15, 1922) Non-skid heel. Felten & Guilleaume Carlswerk A.-G., Köln-Mülheim.

835,540 (December 15, 1922) Bath-and rain-bowl. Gummiwarenfabrik Carl Plaat, Köln-Nippes.

835,559 (April 6, 1922) Non-skid device for truck tires. Wilhelm Bickelmann, Hosterhof bei Illingen, Saar.

835,633 (December 12, 1922) Protector for automobile tires. Louis Meineke, Scheiderstrasse 27, Hannover-Kleefeld.

835,634 (December 12, 1922) Protector for automobile tires. Louis Meineke, Scheidestrasse 27, Hannover-Kleefeld.

835,642 (December 19, 1922) Tread protector for pneumatic tires. Erwin Tietz, Montabur.

835,646 (December 21, 1922) Children's apron. Gummiwarenfabrik Carl Plaat, Köln-Nippes.

835,829 (December 12, 1922) Resilient tire. Sembusto Elastische Radbereifungen, G. m. b. H., Vienna; represented by: L. Werner and E. Wurm, Berlin S. W. 11.

835,859 (November 13, 1922) Rubber hose with lengthwise or spiral ribbing. J. Lonstroff, Aarau, Switzerland; represented by van der Laan, Hannover.

836,138 (December 27, 1922) Twin pneumatic tire. Primus Hepting, Schönenbach, Amt Villingen i. B.

836,416 (December 11, 1922) Rubber sole. Ernst Herkner, Blumenthalstrasse 28, Köln.

836,434 (December 21, 1922) Attachment for rubber soles. Max Götze, Biesterstrasse 6, Hannover.

836,569 (December 20, 1922) Divided rubber heel. Oskar Wilde, Buschweg 53, Gelsenkirchen.

836,646 (December 4, 1922) Rubber heel. Wilhelm Weisheit and Albin Becker, Pfotenhauerstrasse, Dresden.

836,672 (December 21, 1922) Rubber heel. Vorwerk & Sohn, Barmen.

836,677 (December 28, 1922) Rubber soles and heels with leather inserts. Carl Müller, M. Gladbach, Kaiserstrasse 64.

836,846 (December 9, 1922) Soles and heels of armored rubber. Gustav Grünke, Holsterhauserstrasse 134, Essen.

836,858 (December 20, 1922) Rubber sole. Rheinische Gummi-Gesellschaft W. Klotz & Co., Dusseldorf.

836,891 (June 6, 1922) Rubber bathing cap with colored designs. Continental-Caoutchouc-und Guttapercha-Compagnie, Hannover.

837,096 (January 8, 1923) Automobile tire with mud-catching attachment. Wilhelm Josef Behle, Rathaustrasse 10, Saarbrücken.

837,298 (October 30, 1922) Tire protector. Heinrich Bodenstein, Simrockstrasse, Hannover.

837,306 (December 6, 1922) Ladies' elastic belt of solid rubber band. Johann Zentsch, Mittweida i. Sa.

837,358 (July 5, 1922) Rubber sole with leather tip. Osnabrücker Gummi-Manufaktur Deutzmann & Mehring, Osnabrück.

837,482 (November 25, 1922) Exchangeable rubber heel. Karl Blum, Bebelring 20, Mainz.

Germany

Patents Issued, with Dates of Issue

370,051 (December 15, 1920) Pneumatic tire with tin protective cover. Viktor Viel, Bucharest; represented by M. Mintz, Berlin S. W. 11.

370,097 (February 2, 1922) Pocket atomizer. Société Asie Levy & Cie, Boulogne-sur-Seine, France; represented by G. Hirschfeld, Berlin S. W. 68.

370,098 (January 15, 1922) Refillable, pocket inhaling apparatus. Walter Koester, Vogelweide 17, Hamburg.

370,239 (April 21, 1920) Inhaler. Otto Schimkat, Stargard, Pommern.

370,325 (August 23, 1921) Pessary with valve. Leonhard Rossmaier, St. Annaplatz 10, Munich.

370,425 (March 31, 1921) Metal closing ring for pneumatic tire valves. A. Schrader's Son, Inc., Brooklyn, N. Y., United States; represented by R. Heering, Berlin S. W. 61.

370,609 (March 24, 1921) Hot air syringe. Oscar Henry Pieper and Alphonse Ferdinand Pieper, Rochester, New York; represented by Wertheimer, Berlin S. W. 11.

371,071 (November 29, 1921) Rubber nipple with variable outlet. Karl Grützemacher, Schwanebeck, Kr. Oschersleben.

371,335 (October 18, 1921) Nail catcher for rubber tires. Max Bobist, Paulinenstrasse 20, Breslau.

371,657 (October 14, 1915) Inner tube consisting of compressible material, United States Compression Inner Tube Co., Tulsa, Oklahoma, United States; represented by: Dr. Döllner, Seiler and Maemecke, Berlin S. W. 61.

371,766 (December 30, 1921) Feeding-bottle nipple made up of two layers. Jacob Reinshagen, Geising, Erzgebirge.

371,848 (March 10, 1921) Exchangeable rubber tread patch for footwear. Fuga, G. m. b. H., Hannover.

372,173 (October 7, 1922) Pieces to be inserted in rubber tread patches. Max Götze, Biesterstrasse 6, Hannover.

372,236 (January 27, 1922) Rubber heel. Wilhelm G. Randolph, Nesenstrasse 4, Frankfurt-am-Main.

Austria

Patents Issued, with Dates of Publication

A-3416-20 (December 15, 1922) Arrangement for storing and tapping combustible liquids. J. Muschka, Vienna.

A-3598-17 (December 15, 1922) Pneumatic tire reinforced with a number of fabric inserts. Sterns Tire & Tube Co., St. Louis, Missouri, United States.

Trade Marks

United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted February 6, 1923, Act of February 20, 1905

163,905 MOGUL—fountain pens. Muller & Phipps (Asia), Limited, New York, N. Y.

163,922 CANNYGRIP—Shoe soles comprising inner and outer soles of leather and a middle sole of rubber, with parts of the rubber projecting through the outer sole, the uppers being of leather, of fabric or combination of leather and fabric. Commonwealth Shoe & Leather Co., Boston, Mass.

163,934 CAMEL-TATTLER—fountain pens. Dunn-Pen Co., Inc., New York, N. Y.

163,935 CAMEL—fountain pens. Dunn-Pen Co., Inc., New York, N. Y.

163,956 "UNO" CROWLEY'S—mercerized lisle elastic web. Charles H. Crowley, New York, N. Y.

163,961 OPTIMUS—rubber gloves. Stewart & Holmes Drug Co., Seattle, Wash.

163,964 Representation of a palm, with "Palm Brand" among the branches—elastic webbings, tapes, braids, etc. William T. Palmer & Co., Inc., New York, N. Y.

163,971 M B BOOT SHOP M B, the initial letters being display type capitals—boots, shoes, and overshoes, of leather rubber fabrics, and combinations of same. Edward H. Milgram, Gary, Ind.

164,013 "TREOTEX"—elastic webbing. Treo Co., Inc., Jamaica, N. Y.

164,019 PEN-LYN—SHOES of leather, leather and fabric, leather and rubber. Whitehouse & Hardy, Inc., New York, N. Y.

164,020 MAR-GAR—shoes of leather, leather and fabric, leather and rubber. Whitehouse & Hardy, Inc., New York, N. Y.

164,021 The words "NATURE-FLEX" on a background representing the sole of a shoe—boots and shoes of rubber, leather, canvas, and canvas with leather trimmings. Jordan Marsh Co., Boston, Mass.

164,022 Representation of a leg in a stocking, with ruffled ribbon garter below the knee, and on a circular background the words "DAYNTEE MAID," apparently outlined with thread from the top of the stocking—elastic ruffled ribbon for garters, hose supporters, etc. S. L. Migel & Co., New York, N. Y.

164,029 NU-LIFE—rubber heels, soles, and half soles. Hanover Rubber Co., West Hanover, Mass.

164,037 PLI-LITE, describing an arc of a circle—rubber heels, soles, and half soles. Hanover Rubber Co., West Hanover, Mass.

Granted February 13, 1923, Act of February 20, 1905

164,067 Representation of a male figure in costume somewhat resembling that of a Roman soldier of old, but with the word "Inca" on the helmet and a representation of the sun on his breast—pads of rubber or rubber composition for application to boots and shoes. Blakey's Boot Protectors, Limited, Leeds, England.

164,068 A female figure in costume suggesting the Indian, with the word Inca on the band of her headdress and a suggestion of the rising sun on the yoke of her dress—pads of rubber or rubber composition, for boots and shoes. Blakey's Boot Protectors, Limited, Leeds, England.

164,070 WALK-STRAIGHT—boots, shoes, and sandals made wholly or in part of rubber, leather, canvas, or cloth. Louis P. Haight, doing business as The Walk-Straight Club, Boston, Mass.

164,084 SPORTOCASIN, the initial S and final N being display capitals—shoes of leather or leather and rubber combined. Donald B. Abbott, Auburn, Maine.

164,135 GRIPMOR—hose supporters. American Narrow Fabric Co., Worcester, Mass.

164,219 The letter A in diamond shaped frame; beneath it the word "ACHILLES" in script—rubber heels. The Achilles Rubber & Tire Co., Inc., Binghamton, N. Y.

164,228 BETSY ROSS, in script—elastic specialties, such as hose supporters, girdles, abdominal supports, etc. B. & R. Manufacturing Co., Inc., West Hoboken, N. J.

164,231 Portrait of George H. Ruth wearing a cap; beneath the portrait the signature, "BABE" RUTH; beneath this the word Victor, in diamond shaped frame—caps of cloth, leather, or rubber, or combinations of same. Hirschberg & Co., New York, N. Y.

164,232 Same as description for 164,231, except that the style of cap worn in the portrait is different.

164,250 RUBBER ROAD—rubber heels. Brown Shoe Co., Inc., St. Louis, Mo.

164,252 K-F—rubber heels. The K-F Heel Co., Newark, Ohio.

164,253 BO-LO—shoes of leather, leather and fabrics, and leather and rubber. Whitehouse & Hardy, Inc., New York, N. Y.

Granted February 20, 1923, Act of February 20, 1905

164,278 A six-pointed star, with the letter L in center; lines representing rays of light from the star; background of circles; beneath the design the word "ELINSTAR"—elastic corsets, belts, bust supporters, hose supporters, and suspensory bandages. F. Longdon & Co., Derby, England.

164,285 DRAWING MASTER—drawing outfits, including erasers. The Burdette-Murray Co., Cleveland, Ohio.

164,299 DUCKBACK, the final K in duck being a display capital—waterproofing composition for general use. Frank McPhillipps, doing business as Duckback Waterproofing Co., Portland, Ore.

164,359 BRISTOL; two golf clubs crossed in background—golf balls. The Horton Manufacturing Co., Bristol, Conn.

164,367 Representation of the western hemisphere, with the word "ISTHMUS" separating the two continents—water bags. William H. Hegee Co., Inc., Los Angeles, Calif.

164,379 Within a fanciful frame, at the top the word "POLKASE"; beneath this the words "Bloomer," "Apron," "Belt," separated; beneath these, on a black background, "3 IN 1"; beneath this the words "Sanitary Garment"—sanitary bloomers. Polkase Manufacturing Co., New York, N. Y.

164,389 "VOLTITE"—adhesive insulating tape. The Canfield Rubber Co., Bridgeport, Conn.

164,505 BLT on black oval background, and the words "PRESERVES LIFE OF RUBBER" on surrounding outline, shaded by means of straight lines—preservative compound for treating rubber and rubber composition.

164,526 MAXFLI—golf balls. The Dunlop Rubber Co., Limited, London, England.

164,528 HULA MAIDENS—dolls. The Seamless Rubber Co., Inc., New Haven, Conn.

164,619 "APRUS," on black circular background with surrounding circular outline—rubber compound splicing tape and gray friction adhesive tape. Appleton Rubber Co., Franklin and Boston, Mass.

Granted February 20, 1923, Act of March 19, 1920, Section 1 (b)

164,581 "FROM THE MILLS TO THE MILLIONS"—overcoats, suits, raincoats, etc. The Daniel Boone Woolen Mills, Chicago, Ill.

Granted February 27, 1923, Act of February 20, 1905

164,777 BEAUMAL—raincoats and top coats. C. B. Shane Co., Chicago, Ill.

164,779 A small shield bearing the monogram LS; beneath this a placard bearing the words "LIVE STYLE," and above these, in less conspicuous type, the words "FOR LIVE YOUNG MEN"—men's coats, suits and raincoats. Louis Schaeffer, New York, N. Y.

164,798 EVERFLEX—garters and sleeve bands. The Humason Manufacturing Co., Bristol, Conn.

164,810 Within a line border with ornamented corners a fanciful arrangement as of a shield unveiled, having on it the letter L; beneath this the business name of the firm, the word "GOODYEAR" being in display type—raincoats, cravenets, sport coats, oil slickers, mackintoshes, leather coats, overcoats, etc. Benjamin Lobel, doing business as Goodyear Waterproof Co., New York, N. Y.

164,822 TWEENTEX—household aprons. I. B. Kleinert Rubber Co., New York, N. Y.

164,844 "IMPERVO"—adhesive tape. The Canfield Rubber Co., Bridgeport, Conn.

164,898 ORALYKE, the l being a capital script letter, ending in a shaded flourish, furnishing a black background for the words "AMERICAN RUBBER"; above the design appears the name "Dr. Tupper's"—dental gum. Industrial Rubber Corp., Long Island City, New York.

164,899 THE SPAD, arranged to describe a circle, with an airship measuring its diameter—golf balls. Joseph A. Mayers, New York, N. Y.

164,912 Representation of a ball, on which is a crescent moon, bearing the words "MYSTIC MOON BALL," and on the remaining section of the ball the words "It Glows"—luminous baseballs, golf, tennis, and toy balls. Carrie E. McClain, San Antonio, Texas.

164,913 LIFE TUBE, the lower part of the L extending in such a way as to make a diagonal line of separation between the words—swimming buoys. Charles D. Forster, doing business as Life Tube Co., Toledo, Ohio.

The Dominion of Canada

Registered

32,691 BATES—rubber tires and tubes, rubber grips for hockey sticks and tennis rackets, and football bladders. W. & A. Bates, Limited, St. Mary's Mills, Leicester, England.

32,695 DOROTHY DODD PEDO-FRAXIC—boots, shoes, and slippers of leather, rubber, felt, or other fabric. Dorothy Dodd Shoe Co., Boston, Mass.

32,698 QUEEN QUALITY OSTEOTARSAL, and the representation of the sole of a foot—boots, shoes and slippers of leather, felt, rubber, or other fabric. Thomas G. Plant Co., Boston, Mass.

32,734 Representation of a man fixing an automobile tire, with the car alongside, and looking at a sign with the words: "SEALZIT FROM PUNCTURES," the whole surrounded with an automobile tire on which is printed the word "SEALZIT"—mineral compound for sealing tire punctures. David Paterson, Vancouver, British Columbia.

32,752 Word "CURVED," superimposed on the transverse sectional view of a rubber or composition heel having concave and convex surfaces; above the sectional view the representation of a winged foot and the word "Goodyear," the winged foot being inserted between the syllables "Good" and "Year," immediately beneath the word "Goodyear" and above the said sectional view the words "Made in Canada"—Rubber or composition soles or heels. The Goodyear Tire & Rubber Co. of Canada, Limited, Toronto, Ont.

The United Kingdom

Published February 7, 1923

431,028 HARP—goods manufactured from india rubber or gutta percha not included in other classes, but not including elastic sandalings or similar goods. The Civic Co., Limited, 81 Fulham Palace Road, Hammersmith, London, W. 6.

431,081 FEDERAL—all goods included in Class 40. The Federal Rubber Co. of Illinois, Leyton & Holthoff avenues, Cudahy, Wisconsin, U. S. A.

431,190 NEW MOON—golf balls. Broadhurst & Co., Limited, 4 Gibbon street, Bradford, Manchester, Lancashire.

Published February 14, 1923

420,273 PHILIS—raincoats, mackintoshes, and various articles of women's apparel. J. & N. Philips & Co., Limited, 35 Church street, Manchester.

426,567 Representation of a piece of cord tied in a loose knot—india rubber tires with cord foundation. Dunlop Rubber Co., Limited, Fort Dunlop, Holly Lane, Erdington, Birmingham, Warwickshire.

429,803 The word "STANDEX" on a signboard; immediately under it the word "Quality." Above the whole the words "Lewis's Ltd.," and beneath the design the words "Liverpool, Manchester, and Birmingham"—all goods included in Class 40. Lewis', Limited, 40 Ranelagh street, Liverpool, 106-122 Market street, Manchester, and 32 Bull street, Birmingham.

B430,389 Representation of two men walking, in street dress; immediately above them the word "JAQUETTE"; all on a square black background—raincoats and overcoats. Maurice Thompson Jaques, trading as Turner Jaques, 2 Granby street, Leicester.

Published February 21, 1923

422,330 AVON—rubber footwear sundries not included in other classes. The Avon India Rubber Co., Limited, Bath Road, Melksham, Wiltshire, and 343-5 Euston Road, London, N. W. 1.

422,331 AVON—golf balls. The Avon India Rubber Co., Limited, Bath Road, Melksham, Wiltshire, and 343-5 Euston Road, London, N. W. 1.

427,080 Red, white, and blue design arranged in the form of an oval mat, with the red in the center—all goods in Class 40. The Beldam Tyre Co., (1920) Limited, Windmill Road, Brentford, Middlesex.

427,081 Description same as for 427,080—playing balls included in Class 49. The Beldam Tyre Co., (1920) Limited, Windmill Road, Brentford, Middlesex.

429,323 LIGA—goods made of india rubber, not included in other classes. Liga Gummiwerke Aktiengesellschaft (a joint company incorporated under the laws of Germany), 2 Obergasse, Hausen, Frankfort-on-Main, Germany. For service in the United Kingdom address in care of J. E. Evans-Jackson & Co., 57-60 Holborn Viaduct, London, E. C. 1.

429,324 A rubber sole with the word "LIGA" following the curve at the toe-end—rubber soles and heels for boots and shoes. Liga Gummiwerke Aktiengesellschaft, 2 Obergasse, Hausen, Frankfort-on-Main, Germany.

431,431 BEACON—engine and machine packings and jointings included in Class 50. The Beldam Packing & Rubber Co., Limited, 29 Gracechurch street, London, E. C. 3.

431,466 TAKAWALK—soles and heels for boots and shoes, made partly or entirely of rubber. The De Nevers Rubber Tyre Co., Limited, Earlsfield Rubber Mills, 23-39 Bendon Valley, Earlsfield, London, S. W. 18.

431,787 SIGNET—tobacco pouches included in Class 40. The Civic Co., Limited, 81 Fulham Palace Road, Hammersmith, London, W. 6.

431,821 DURICORD—tires made of india rubber. The Avon India Rubber Co., Limited, The Rubber Works, Bath Road, Melksham, Wiltshire, and 343 to 345 Euston Road, London, N. W. 1.

431,830 "AVON" on a block resembling stone, supported by two similar blocks resembling posts—galoshes and boots and shoes of rubber. The Avon India Rubber Co., Limited, Rubber Works, Bath Road, Melksham, Wiltshire, and 343-5 Euston Road, London, N. W. 1.

431,960 BLUE PENNANT—all goods included in Class 40. The Federal Rubber Co., Leyton & Holthoff avenues, Cudahy, Wisconsin, U. S. A.

432,219 OBARMAC, written in upward slanting line. Mackintoshes. Albert Richard Hobbs, 183 Mitcham Lane, Streatham, London, S. W. 16.

432,275 AIRSOL—tires manufactured of india rubber or in which india rubber predominates. The Dunlop Rubber Co., Limited, Fort Dunlop, Holly Lane, Erdington, Birmingham, Warwickshire.

432,467 RAPTOR—all goods included in Class 40. Naamlooze-Vennootschap Rubberfabriek "Vrederstein" Ingenieurs Bureau Voorheen E. L. C. Schiff (a company incorporated and organized under the laws of the Netherlands), 130 Haagweg, Loosduinen, Holland. Address for service in the United Kingdom, care of Johnsons & Willcox, 47 Lincoln's Inn Fields, London, W. C. 2.

432,565 GADFLY—golf balls, Lillywhites, Limited, Yeoman House, 31 Haymarket, London, S. W. 1.

New Zealand

Published December 30, 1922

18,930 FLEXICORD—pneumatic and other india rubber tires. The India Rubber, Gutta Percha and Telegraph Works Co., Inc., 106 Cannon street, London, England.

19,468 XYIONITE—goods of india rubber and the like, included only in Class 40.

Designs

The United States

Issued* February 6, 1923

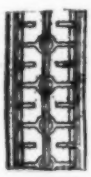
61,872 Tire. Term 14 years. Harry C. Hower, Chicago, Ill.

61,873 Tire. Term 14 years. Harry C. Hower, Chicago, Ill.

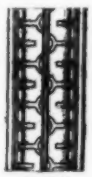
61,876 Rubber heel. Term 7 years. Accursio Monastero, Norristown, Pa.

61,885 Rubber heel. Term 14 years. Charles D. Armstrong, Pittsburgh, Pa., assignor to Armstrong Cork Co., Pittsburgh, Pa.

61,909 Massaging brush. Term 14 years. Morris L. Goldberg, Brooklyn, N. Y.

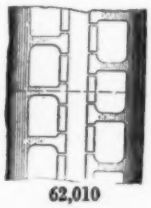


61,872



61,873

61,919



62,010

61,919 Pneumatic tire tread. Term 14 years. Victor A. Parker and Edward M. Sears, Akron, Ohio, assignors to the B. F. Goodrich Co., New York, N. Y.

Issued* February 27, 1923

62,010 Tire tread. Term 14 years. Harold D. Reichard, Akron, Ohio, assignor to Wildman Rubber Co., Bay City, Mich., a corporation of Delaware.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Registered

5,682 Vehicle tire, tread comprising a central circumferential rib, on each side of which is a circumferential row of substantially y-shaped depressions. Ernest L. Kingsley, Toronto, Ont.

Labels

The United States

Registered February 13, 1923

25,590 "The Genuine Safety Cushion Heel"—for rubber heels. The Genuine Rubber Co., Saugus, Mass.

Prints

The United States

Registered February 13, 1923

6,533 Title: "American Akron"—For advertising bathing shoes. The American Rubber & Tire Co., Akron, Ohio.

Antwerp Crude Rubber Market—1922[1]

The total amount of business done on the Antwerp crude rubber market during 1922 shows some improvement over that of the preceding year.

The figures for all sorts were 1,231,567 kilos in 1922, against 907,753 kilos in 1921. Belgian Congo grades and others accounted for 1,098,185 kilos in 1922, against 712,709 kilos in 1921. On the other hand, plantation grades amounted to only 133,382 kilos during the year under review, as compared with 195,044 kilos in the preceding year.

The low price of rubber during the greater part of the year made the exploitation of any but the best grades of mild rubber unprofitable. This has had the good effect of placing nothing but good wild rubber before the public. The quality of this rubber is better than it has ever been and it is understood that producers will continue this policy.

The development of Hevea plantations in the Congo continues to progress, and the rubber is fully as good as that of Asiatic plantation rubber. It has, in fact, fetched the same prices as the latter kind. However, the chief fault of the African producers of crude rubber seems still to be over-smoking and insufficient preliminary drying.

While rubber touched 8*d*. per pound during 1921, it fell to the unheard of figure of 6⅞*d*. during 1922. However, after restriction was introduced, the situation improved immensely.

Congo grades, of which there was little on hand, profited largely by this renewed activity and at the end of December were very much in demand, when Black Kassai fetched 7 to 7.25 francs, instead of 4.25 francs during the same month of 1921; Black Upper Congo was quoted at 6.75 to 7 francs, instead of 4.25 francs; Upper Congo ordinary Red obtained 6.25 to 6.50 francs, against 4 to 4.25 francs; Kassai and Loanda II brought 4.50-4.75, against 3.25, and Red Thimbles were quoted at 1.30 francs, instead of 1.15 francs as in 1921.

The market in futures was handicapped by a lack of stocks available and only a limited amount of business could be transacted, whereas considerable business could have been done. Prices for January, up to May, 1922, were 8.90 francs and from June to December 8.95. In 1921 futures were quoted as follows: January, 5.75; February, 5.80; March, 5.85; April, 5.90; May, 5.95; June-December, 6 francs.

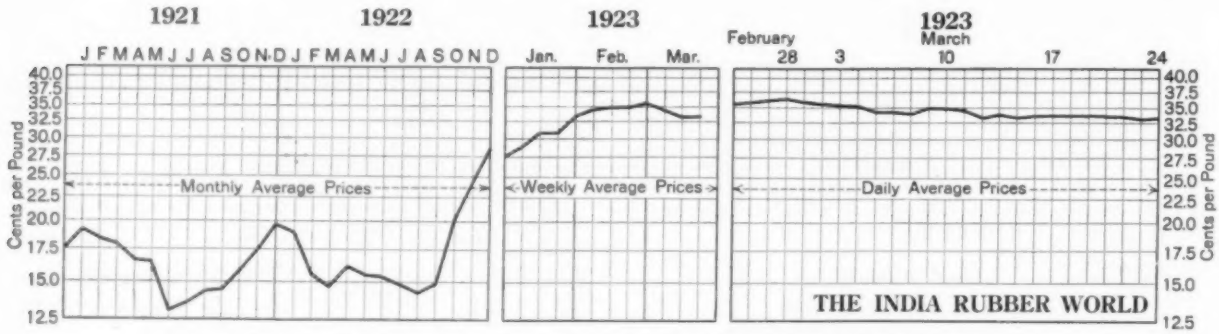
Examining the important events of 1922, it would appear as though an optimistic attitude were justified as far as the plantation rubber industry is concerned, and, on a more reduced scale, as far as wild rubber is concerned. The measures of restriction will assure the existence and profitable exploitation of rubber and protect the capital invested in the industry by a moderate and reasonable exploitation of the trees, which will allow them more rest and the necessary care for their good conservation.

[1] From report of Grisar & Co., Antwerp, Belgium.

United States Crude and Waste Rubber Imports for 1923 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1923	Totals 1922	Balata	Miscellaneous	Waste
January .....tons	29,354	1,233	549	61	.....	.....	31,197	21,867	64	257	382
February	21,815	2,004	308	93	.....	.....	24,220	28,973	25	397	684
Totals, 2 months, 1923.....tons	51,169	3,237	857	154	.....	.....	55,417	.....	89	654	1,066
Totals, 2 months, 1922.....	48,044	2,263	462	30	.....	41	.....	50,840	70	574	91

Compiled by the Rubber Association of America, Inc.



Ratio Graph of New York Market Fluctuations—Average Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

THE course of New York spot crude rubber prices during the past month had a slightly downward tendency, ranging from 35½ cents on February 24 to 33½ on March 24, for ribbed smoked sheets. The highest price quoted during the month was 36¼ cents on March 1. The range of prices followed that cabled from London and reflected the conditions prevailing there.

The features of the domestic market by weekly periods for four weeks ended March 24 were as follows.

Week ended the 3d showed increase of activity and fair factory demand. Prices advanced during the first half of the period and eased off at the end with speculative holdings going into stronger hands; price closing at 35¾ cents.

Week ended the 10th began with price steady, gradually easing off in sympathy with London conditions, becoming very weak on the seventh, with general selling and liquidation in both markets. Many factories took advantage of the drop. Prices reacted strongly with higher cables and the week closed firm at 34¾ cents, with few sellers.

Week ended the 17th the market was very erratic. Prices fell off from those of the week previous, due to lack of factory demand. The week closed with prices firm at 33½, a drop of 1½ cents below the closing price of the week before.

Week ended the 24th the market remained very dull the whole week. Factories were seeking scattered and distressed lots at prices under the market. Prices are expected to remain close to present figures until April 1, when activity and higher prices following spring buying on the part of factory interests are anticipated. The closing price for the week was 33½ cents.

Paras were steady throughout the month. Other grades were quiet but firm, with no weak holdings.

Imports of all grades during February, 1923, were 24,220 tons, compared with 28,973 tons one year ago. Plantation arrivals for February, 1923, were 21,815 tons, compared with 27,270 tons one year ago. Total importations of all grades for two months ended February 28 were 55,417 tons, compared with 50,840 tons for the corresponding period last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. March 1, Spot first latex crêpe, 36-36¼ cents; Apr.-June, 36¾ cents; July-Sept., 37¼ cents; July-Dec., 38 cents. March 26. Spot first latex crêpe, 33½-33¾ cents; Apr.-June 33⅞ cents; July-Sept., 34¼ cents; July-Dec., 34¾ cents.

March 1. Spot ribbed smoked sheets, 36-36¼ cents; Apr.-June, 36¾ cents; July-Sept., 37¼ cents; July-Dec., 38 cents. March 26. Spot ribbed smoked sheets, 33½-33¾ cents; Apr.-June, 33⅞ cents; July-Sept., 34¼ cents; July-Dec., 34¾ cents.

March 1. Spot No. 1 amber crêpe, 36 cents; Apr.-June, 36¾ cents. March 26. Spot No. 1 amber crêpe, 32¾-33 cents; Apr.-June, 33 cents.

March 1. Spot No. 1 rolled brown crêpe, 32¾ cents; Apr.-June, 33¼ cents. March 26. Spot No. 1 rolled brown crepe, 30½ cents; Apr.-June, 30½ cents.

SOUTH AMERICAN PARÁS AND CAUCHO. March 1. Spot, upriver fine, 33¾ cents; islands fine, 30 cents; upriver coarse, 28½ cents; island coarse, 17¼ cents; Cametá, 17¼ cents; caucho ball, 30 cents. March 26. Spot, upriver fine, 30½ cents; islands fine, 29 cents; upriver coarse, 27½ cents; islands coarse, 15 cents; Cametá, 15 cents; caucho ball, 27-28 cents.

London

The range of prices, beginning February 24 at 17⅜ pence, receded very slowly to 16⅛ on March 24. The price touched 18 pence March 1 and fell to 16 pence March 14, these figures representing the highest and lowest in the four weeks under review.

London stocks were reported at over 80,000 tons about March 1 and the market almost stationary. Some large American interests were said to be buying rubber in the Far East early in the month. The market was inactive, with prices weak as they steadily diminished toward the last of the month close to the level of 16½ pence, in a very narrow market.

New York Quotations

Following are the New York spot quotations per pound, for one year, one month ago, and March 26, the current date:

Plantation Hevea	March 1, 1922	March 1, 1923	March 26, 1923
LATEX			
Rubber latex (Hevea) *gal.*	$1.25 @	$1.25 @1.35	$1.25 @$1.35
CREPE			
First latex	.15¼ @	.36 @.36¼	.33½ @.33¾
Off latex	.14½ @.14¾	.35¾ @	.33¼ @.33½
Amber No. 1	.15 @.15¼	.36 @	.32¾ @.33
Amber No. 2	.14¾ @	.35½ @	.32¼ @.33½
Amber No. 3	.14½ @	.35 @	.32 @
Brown, thick, thin, clean	.14 @	.34¼ @.34½	.32 @.32¼
Brown, specky	.13 @	.33 @	.31½ @
Brown, rolled	.13¼ @.13½	.32¼ @	.30½ @
SHEET			
Smoked, ribbed	.15¼ @	.36 @.36¼	.33½ @.33¾
Smoked, plain	.14½ @	†.35 @	.33 @
Unsmoked	.14 @.14½	†.34 @	.32 @
SCRAP			
Colombo scrap No. 1	.13¼ @.14	†.30 @	@
Colombo scrap No. 2	.13 @	†.29 @	@

†Nominal.

Crude Rubber Market—*Continued*

East Indian

PONTIANAK	March 1, 1922	March 1, 1923	March 26, 1923
Banjermassin	.08½@	.08 @	.08 @
Pressed block	.13 @	.14 @	.14 @
Sarawak	.08 @	.07½@	.07½@

South American

PARAS

Upriver fine	.18 @.18¼	.33¾@	.30½@
Upriver fine*	@	@	*.43 @
Upriver, medium	.17 @	.30½@	.28½@
Upriver coarse	.13 @	.28½@	.27½@
Upriver, weak, fine	.15 @.16	@	@
Islands fine	.17 @.17½	.30 @	.29 @
Islands fine*	@	@	@
Islands medium	.15 @.15½	.27½@	.25 @
Islands coarse	.08 @	.17½@	.15 @
Cametá	.09½@.10	.17¼@	.15 @
Cametá*	@	@	@
Acre Bolivian fine	.18½@	.34 @	.30½@
Acre Bolivian fine*	@	*.42 @	*.43 @
Beni Bolivian	.18½@.19	.34 @	.30½@
Madeira fine	.19 @.19¼	.34½@	.31 @
Peruvian fine	.17 @.17½	.31½@	.29 @
Tapajos fine	.17 @.17½	.31½@	.29 @

CAUCHO

Upper caucho ball	.12¼@.12½	.30 @	.28 @
Upper caucho ball*	@	*.40 @	*.40 @
Lower caucho ball	.11½@	.29 @	.27 @

Maniçobas

Ceará negro heads	†.11 @	.27 @	.24 @
Ceará scrap	†.07 @	.15 @	.13 @
Maniçoba 30%, guaranty	†.08½@	.26 @	.26 @
Mangabeira, thin sheet	†.14 @	.30 @	.30 @

Centrals

Central scrap	.08 @.10	@	.25 @.26
Central scrap and strip	.07 @.09	@	.24 @.25
Central wet sheet	.03 @.04	.22 @	.18 @.20
Corinto scrap	.09 @.11	.26 @.27	.25 @.26
Esmeralda sausage	.09 @.11	.26 @.27	.25 @.26
Guayule washed and dried	.20 @	.29 @	.29 @

Africans

Benguela, No. 1, 28½%	.09 @	.20 @	.20 @
Benguela, No. 2, 32½%	@	.18 @	.17 @
Congo prime, black upper	.15½@	.29 @	.25 @
Congo prime, red upper	.15½@	.26 @	.26 @
Kassai, black	.15½@	.28 @	.26 @
red	.15½@	.25 @	.27 @

Gutta Percha

Gutta Siak	.18¾@	.20½@.21½	.20 @
Red Macassar	2.80 @	3.00 @	3.10 @

Balata

Block, Ciudad Boliver	.52 @.53	.75 @.78	.75 @
Colombia	.40 @.42	.64 @.67	.66 @
Panama	.25 @.38	.64 @.67	.64 @
Surinam, sheet	.63 @.64	.88 @	.85 @
amber	.68 @.70	.93 @	.92 @

Chicle

Colombia	@	.25 @.30	.25 @.30
Honduras	@	.62 @	.62 @
Venezuela	@	.63 @	.63 @
Yucatan fine	@	.65 @	.65 @

*Washed and dried crêpe. Shipment from Brazil.

†Nominal.

Comparative Low and High New York Spot Rubber Prices

	March 1923*	March 1922	March 1921
PLANTATIONS			
First latex crêpe	$0.33½@$0.36¼	$0.13¾@$0.15	$0.18 @$0.19¼
Smoked sheet, ribbed	.33½@ .36¼	.13¾@ .15¼	.16¼@ .18
PARAS			
Upriver, fine	.30½@ .34	.17 @ .17¾	.17 @ .18
Upriver, coarse	.26½@ .28½	.12 @ .13	.11¼@ .12
Islands, fine	.28½@ .32	.16 @ .17½	.17 @ .18
Islands, coarse	.15 @ .26	.07½@ ...	.11 @ .12
Cametá	.14 @ .17	.09 @ .11	.11 @ ...

*Figured to March 26, 1923.

Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report under date of March 9, 1923:

The rubber market has been flat this week and prices have moved only in a downward direction. Consequently the up and down movement, which had become the usual feature, came to an end and that in a rather unexpected way.

Realizations and want of buyers combined to bring about this result and to prevent a large turnover. The close is at the lowest, as follows:

Hevea crêpe Fl.	$0.91	Sheets Fl. $0.91½	Spot.
Hevea crêpe Fl.	.92	Sheets Fl. .93	April to June.
Hevea crêpe Fl.	.93½	Sheets Fl. .94½	July to September.
Hevea crêpe Fl.	.95½	Sheets Fl. .96	October to December.

Reclaimed Rubber

Essentially all grades of reclaimed rubber are quoted at recessions in price from those reported a month ago. There is a liberal demand for most grades and reclaiming mills generally are operating on full schedule. Never has better value in reclaims been offered at closer figures. This condition obtains also in manufactured rubber goods lines, notably in tires.

A new comprehensive list of grades is given in the subjoined revised quotations:

New York Quotations

March 24, 1923

Prices subject to change without notice

Reclaimed Stocks

		Per Pound
FRICTION		
Compounded	*lb.*	$0.18 @$0.19
Pure gum friction	*lb.*	.24 @ .25
TUBE		
Compounded	*lb.*	.13½@ .14½
Floating	*lb.*	.16 @ .16½
AUTO TIRE		
Black	*lb.*	.09¾@ .10
Gray	*lb.*	.11½@ .11¾
White	*lb.*	.13½@ .14
Black, washed	*lb.*	.11 @ .11¼
SHOE		
Unwashed	*lb.*	.11½@ .12
Washed	*lb.*	.13¾@ .14¼
MECHANICAL	*lb.*	
TRUCK TIRE	*lb.*	

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

PLANTATIONS Sheet	February, 1923 19	20	21	22*	23	24	26	27	28	March, 1923 1	2	3	5	6	7	8	9	10	12	13	14	15	16	17
Ribbed smoked	35⅜	35⅜	35⅜	....	35⅜	35⅜	35½	35⅞	36⅛	35⅞	35⅛	35⅛	35⅛	34⅜	34½	34¼	35¼	35⅛	34⅜	33⅜	33⅞	33½	33⅜	33¼
Crêpe																								
First latex	35⅛	35⅛	35⅜	....	35⅜	35⅛	35½	35⅞	36⅛	35⅞	35⅝	35⅝	35⅛	34⅝	34½	34¼	35	35⅛	34⅜	33⅝	33⅞	33½	33⅜	33⅛
Off latex	34⅞	35	35	....	35	35	35⅛	35⅜	35¾	35⅜	35⅛	35⅛	34⅝	34¼	34	33¾	34⅜	34⅝	34	33⅛	33½	32⅞	33	33⅛
No. 1 blanket	34¾	34¾	34⅞	....	34⅞	34⅞	35⅛	35½	35¾	35½	35⅛	35⅛	34¾	34⅜	34⅛	33½	34½	34½	33⅞	33⅜	33½	33⅜	33⅜	33
No. 2 blanket	34¼	34⅜	34⅜	....	34⅝	34⅜	34⅝	34¾	34⅞	34¾	34⅜	34⅜	34¼	34⅛	33⅝	33	33¾	34	33½	32¾	32⅞	32	32⅜	32⅛
No. 3 blanket	34	33⅞	34	....	34⅛	34	34¼	34½	34⅜	34½	34⅛	34⅛	33¾	33⅜	33⅛	32¼	33½	33⅜	33⅛	32½	32⅜	31⅜	31⅞	32¼
Thin, clean, brown	34⅛	34¼	34⅛	....	34⅛	34¼	34⅜	34½	34¾	34½	34¼	34⅝	34⅜	33¾	33⅜	32⅞	33⅜	33⅜	33⅜	32¾	32¾	32½	32¼	32⅝
Specky brown	33⅛	33½	33⅜	....	33½	33½	33½	33⅝	33⅞	33⅝	33½	33⅜	33¼	32⅞	32½	32	32⅝	32⅞	32⅜	31¾	31⅜	31⅜	31⅜	31¾
Rolled brown	32⅜	32¼	32½	....	32¾	32⅜	32½	32⅞	32¾	32⅝	32⅜	32⅜	31⅞	31⅞	31½	31	31	31¼	31	30⅜	30⅜	30½	30⅝	29⅞

*Holiday.

Crude Rubber Arrivals at New York as Stated by Ships' Manifests

Parás and Caucho

	Fine	Medium	Coarse	Caucho	Totals Pounds
FEBRUARY 22. By "Southern Cross," Montevideo.					
Paul Bertuch	20,386	....	....	....	20,386
FEBRUARY 23. By "Denis," Pará and Manáos.					
H. A. Astlett & Co.	44,000	350	12,140	13,280	69,770
Paul Bertuch	33,087	2,202	43,186	....	78,475
F. R. Henderson & Co., Inc.	....	4,680	4,700	1,000	10,380
L. Littlejohn & Co., Inc.	183,680	....	....	....	183,680
Meyer & Brown, Inc.	11,200	....	....	....	11,200
Poel & Kelly, Inc.	65,635	....	949	1,718	68,302
Ultramares Corporation	12,900	....	....	....	12,900
H. A. Astlett & Co.	‡13,240	....	....	....	‡13,240
FEBRUARY 24. By "Michael," Pará and Manáos.					
Paul Bertuch	187,595	13,228	61,254	30,372	292,449
General Rubber Co.	33,600	....	....	....	33,600
F. R. Henderson & Co., Inc.	86,480	....	....	....	86,480
L. Littlejohn & Co., Inc.	123,200	....	....	....	123,200
Meyer & Brown, Inc.	56,000	10,080	24,640	67,200	157,920
Poel & Kelly, Inc.	54,191	15,420	35,199	70,385	175,195
Ultramares Corporation	23,200	1,100	23,400	....	47,700

‡Washed and dried in Brazil.

	Fine	Medium	Coarse	Caucho	Totals Pounds
FEBRUARY 26. By "Leighton," Pará and Manáos.					
H. A. Astlett & Co.	33,660	....	15,840	....	49,500
L. Littlejohn & Co., Inc.	105,821	....	....	....	105,821
Poel & Kelly, Inc.	171,370	11,795	39,069	8,720	230,954
MARCH 10. By "Waukegan," Havre.					
Poel & Kelly, Inc.	....	....	....	182,981	182,981
MARCH 12. By "Virgil," Pará and Manáos.					
H. A. Astlett & Co.	33,440	12,210	4,220	150	50,020
H. A. Astlett & Co.	‡15,400	....	....	‡12,080	‡27,480
Paul Bertuch	158,119	8,171	55,789	27	222,106
General Rubber Co.	36,560	....	2,240	....	39,200
L. Littlejohn & Co., Inc.	30,247	....	....	....	30,247
Meyer & Brown, Inc.	112,000	22,400	11,200	....	145,600
Poel & Kelly, Inc.	46,000	4,200	15,500	1,400	67,100
Ultramares Corporation	....	....	13,400	....	13,400
MARCH 17. By "Dominic," Pará.					
H. A. Astlett & Co.	36,190	4,440	42,590	....	83,220
Meyer & Brown, Inc.	....	....	....	22,400	22,400
H. A. Astlett & Co.	‡56,980	....	‡28,640	....	85,620

Plantations

(Figured at 180 lbs. to the bale or case.)

	Pounds	Totals
FEBRUARY 20. By "Egremont," Far East.		
Various	54,540	54,540
FEBRUARY 20. By "Northwestern Miller," London.		
L. Littlejohn & Co., Inc.	224,000	
Various	26,920	250,920
FEBRUARY 21. By "Mesaba," London.		
L. Littlejohn & Co., Inc.	224,000	
Various	244,180	468,180
FEBRUARY 21. By "Pres. Van Buren," London.		
Various	54,720	54,720
FEBRUARY 23. By "Rhodes Island," London.		
Poel & Kelly, Inc.	*48,884	48,884
FEBRUARY 23. By "Bradford City," London.		
Poel & Kelly, Inc.	24,034	
Various	63,466	87,500
FEBRUARY 23. By "Senia," Bahia.		
Adolph Hirsch & Co., Inc.	10,000	10,000
FEBRUARY 23. By "Port Auckland," London.		
L. Littlejohn & Co., Inc.	237,400	
Poel & Kelly, Inc.	355,563	
Various	79,697	672,660
FEBRUARY 25. By "City of Naples," Far East.		
General Rubber Co.	33,600	
L. Littlejohn & Co., Inc.	224,000	
H. Muehlstein & Co.	33,600	
Poel & Kelly, Inc.	44,800	
William H. Stiles & Co.	11,200	
Charles T. Wilson Co., Inc.	168,000	
Various	246,380	761,580
FEBRUARY 25. By "Minnekahda," London.		
Poel & Kelly, Inc.	22,820	
Various	91,660	114,480
FEBRUARY 26. By "Calchas," Far East.		
H. A. Astlett & Co.	116,480	
Baird Rubber & Trading Co., Inc.	364,000	
General Rubber Co.	1,411,800	
F. R. Henderson & Co., Inc.	201,600	
Adolph Hirsch & Co., Inc.	22,400	
L. Littlejohn & Co., Inc.	2,228,800	
Meyer & Brown, Inc.	674,240	
H. Muehlstein & Co., Inc.	425,600	
J. T. Johnstone & Co., Inc.	125,768	
H. Muehlstein & Co., Inc.	*224,000	
Poel & Kelly, Inc.	1,019,519	
Fred Stern & Co., Inc.	331,989	
William H. Stiles & Co.	112,000	
Charles T. Wilson Co., Inc.	145,600	
Charles T. Wilson Co., Inc.	*56,000	
L. Littlejohn & Co., Inc.	*56,000	
Hood Rubber Co.	*44,776	
Various	*96,224	
Various	1,071,564	8,928,360
FEBRUARY 26. By "Bridgetown," Cartagena.		
Various	1,260	1,260
FEBRUARY 26. By "Menado," Far East.		
H. A. Astlett & Co.	11,200	
Baird Rubber & Trading Co., Inc.	22,400	
General Rubber Co.	44,800	
L. Littlejohn & Co., Inc.	571,200	
Poel & Kelly, Inc.	572,123	
H. Muehlstein & Co., Inc.	306,880	
Charles T. Wilson Co., Inc.	176,960	
Various	112,797	1,818,360

*Arrived at Boston.
†Arrived at Vancouver, Canada.

	Pounds	Totals
FEBRUARY 26. By "Empress of Canada," Far East.		
Poel & Kelly, Inc.	†56,000	56,000
MARCH 1. By "Antonia," London.		
General Rubber Co.	452,480	
Poel & Kelly, Inc.	407,615	
Various	457,685	1,317,780
MARCH 1. By "Pres. Polk," London.		
L. Littlejohn & Co., Inc.	22,400	22,400
MARCH 2. By "City of Pittsburgh," Far East.		
H. A. Astlett & Co.	71,680	
Baird Rubber & Trading Co.	453,600	
General Rubber Co.	44,800	
J. T. Johnstone & Co., Inc.	174,424	
L. Littlejohn & Co., Inc.	1,792,000	
Meyer & Brown, Inc.	571,200	
H. Muehlstein & Co., Inc.	257,600	
Poel & Kelly, Inc.	97,520	
Fred Stern & Co., Inc.	51,296	
William H. Stiles & Co.	123,200	
Charles T. Wilson Co., Inc.	432,320	
L. Littlejohn & Co., Inc.	*78,400	
Various	*58,580	
Various	1,909,060	6,115,680
MARCH 2. By "Chicago," Havre.		
Various	18,000	18,000
MARCH 3. By "Vascenia," London.		
H. A. Astlett & Co.	336,000	
L. Littlejohn & Co., Inc.	985,600	
H. Muehlstein & Co., Inc.	29,120	
William H. Stiles & Co.	112,000	
Various	1,502,060	2,964,780
MARCH 4. By "Paul Luckenbach," Far East.		
Poel & Kelly, Inc.	89,600	89,600
MARCH 4. By "Elmsport," Rotterdam.		
Baird Rubber & Trading Co., Inc.	49,700	
Various	7,540	57,240
MARCH 5. By "Ryndam," Far East.		
Baird Rubber & Trading Co., Inc.	16,800	
Poel & Kelly, Inc.	22,554	
L. Littlejohn & Co., Inc.	44,800	84,154
MARCH 6. By "Vechtdijk," Far East.		
H. A. Astlett & Co.	67,200	
General Rubber Co.	400,960	
F. R. Henderson & Co., Inc.	112,000	
L. Littlejohn & Co., Inc.	416,640	
Meyer & Brown, Inc.	29,120	
H. Muehlstein & Co., Inc.	125,440	
Poel & Kelly, Inc.	411,062	
Fred Stern & Co., Inc.	56,267	
Charles T. Wilson Co., Inc.	145,600	
Various	721,331	2,485,620
MARCH 6. By "Argus," Antwerp.		
Various	22,140	22,140
MARCH 6. By "Cedric," Liverpool.		
Various	109,260	109,260
MARCH 6. By "Comeric," Far East.		
H. A. Astlett & Co.	33,600	
Baird Rubber & Trading Co.	22,400	
General Rubber Co.	89,600	
L. Littlejohn & Co., Inc.	481,600	
H. Muehlstein & Co., Inc.	56,000	
Poel & Kelly, Inc.	15,615	
Charles T. Wilson Co., Inc.	138,880	
Charles T. Wilson Co., Inc.	*33,600	
Various	407,905	1,279,200
MARCH 7. By "Tyrrhenia," Hamburg.		
Poel & Kelly, Inc.	78,156	
Fred Stern & Co., Inc.	32,888	
Various	12,616	123,660

	Pounds	Totals
MARCH 10. By "Tenchurch," Marseilles.		
Various	139,680	139,680
MARCH 10. By "Calcutta Maru," Far East.		
General Rubber Co.	118,720	
J. T. Johnstone & Co., Inc.	61,600	
L. Littlejohn & Co., Inc.	224,000	
Meyer & Brown, Inc.	56,000	
Fred Stern & Co., Inc.	224,000	
Various	161,500	845,820
MARCH 10. By "Pres. Garfield," London.		
Various	126,900	126,900
MARCH 10. By "Manchuria," Hamburg.		
Various	28,800	28,800
MARCH 10. By "Blijendijk," Far East.		
L. Littlejohn & Co., Inc.	58,640	
H. Muehlstein & Co., Inc.	40,320	
Poel & Kelly, Inc.	23,130	122,090
MARCH 10. By "Waukegan," Havre.		
Various	132,660	132,660
MARCH 12. By "West Eldara," Bordeaux.		
L. Littlejohn & Co., Inc.	25,103	25,103
MARCH 12. By "Mt. Clinton," Hamburg.		
L. Littlejohn & Co., Inc.	44,800	44,800
MARCH 12. By "Port Lyttleton," Liverpool.		
Baird Rubber & Trading Co., Inc.	159,690	159,690
MARCH 12. By "Clan Mackinlay," Far East.		
General Rubber Co.	56,000	
F. R. Henderson & Co., Inc.	56,000	
L. Littlejohn & Co., Inc.	291,200	
Meyer & Brown, Inc.	112,000	
Various	52,860	568,060
MARCH 12. By "Maryland," London.		
General Rubber Co.	291,200	
L. Littlejohn & Co., Inc.	278,832	
Meyer & Brown, Inc.	112,000	
Various	1,207,968	1,890,000
MARCH 13. By "Valacia," London.		
General Rubber Co.	219,520	
L. Littlejohn & Co., Inc.	33,600	
Poel & Kelly, Inc.	11,181	
Various	120,719	385,020
MARCH 14. By "Anniston City," Far East.		
Poel & Kelly, Inc.	134,400	134,400
MARCH 15. By "Albania," London.		
Baird Rubber & Trading Co., Inc.	84,260	
General Rubber Co.	228,480	
Various	48,160	360,900
MARCH 15. By "President Adams," London.		
Various	41,400	41,400
MARCH 15. By "Thuringia," Far East.		
H. Muehlstein & Co., Inc.	78,400	78,400
MARCH 18. By "Nieuw Amsterdam," Rotterdam.		
Various	294,020	294,020
MARCH 18. By "Wray Castle," Far East.		
Meyer & Brown, Inc.	296,800	
Fred Stern & Co., Inc.	31,248	
Various	*388,980	
Various	6,768,724	7,485,752
MARCH 18. By "Silverash," Far East.		
General Rubber Co.	44,800	
Fred Stern & Co., Inc.	44,800	89,600
MARCH 18. By "Meltonian," London.		
Fred Stern & Co., Inc.	3,454	3,454
MARCH 18. By "Machaon," Far East.		
Meyer & Brown, Inc.	800,800	
Fred Stern & Co., Inc.	327,040	1,127,840

	Pounds	Totals
MARCH 18. By "Mobile City," Far East.		
Meyer & Brown, Inc	47,040	
Fred Stern & Co., Inc.....	31,360	78,400

Rubber Latex

MARCH 6. By "Vechtdijk," Belawan-Deli.		
Various		120 tons
MARCH 18. By "Wray Castle," Belawan-Deli.		
Various		75 tons

Centrals

FEBRUARY 9. By "Garfield," Bahia de Caraquez.		
Ultramares Corporation	12,932	12,932
MARCH 12. By "Colombia," Corinto.		
Ultramares Corporation	1,900	1,900
MARCH 13. By "Lord Ormonde," Guayaquil.		
Various	3,300	3,300

Africans

JANUARY 22. By "Celtic," Liverpool.		
Fred Stern & Co., Inc.....	22,286	
Various	17,694	39,980
JANUARY 22. By "Siam City," Liverpool.		
Various	41,910	41,910
JANUARY 27. By "Kroonland," Antwerp.		
Various	46,640	46,640
JANUARY 30. By "Tyrrhenia," London.		
General Rubber Co.	11,200	11,200
JANUARY 31. By "Anaconda," Antwerp.		
Various	67,320	67,320
FEBRUARY 5. By "Caronia," Liverpool.		
Various	54,000	54,000
FEBRUARY 15. By "Elkton," London.		
General Rubber Co.....	44,800	44,800
FEBRUARY 19. By "Celtic," Liverpool.		
Fred Stern & Co., Inc.....	12,444	12,444
FEBRUARY 23. By "Bradford City," London.		
H. Muehlstein & Co., Inc....	35,840	
Various	268,640	304,480
FEBRUARY 25. By "Minnekahda," Antwerp.		
H. Muehlstein & Co., Inc....	44,800	44,800
MARCH 5. By "Paris," Havre.		
Fred Stern & Co., Inc.....	21,755	21,755
MARCH 6. By "West Cheron," Antwerp.		
H. Muehlstein & Co., Inc.	29,120	29,120
MARCH 11. By "West Eldara," Bordeaux.		
Meyer & Brown, Inc.....	56,000	
H. Muehlstein & Co., Inc....	44,800	100,800
MARCH 12. By "Maryland," Hamburg.		
Ultramares Corporation	163,000	163,000
MARCH 12. By "Port Lyttleton," Liverpool.		
Poel & Kelly, Inc.....	7,000	7,000
MARCH 12. By "Huronian," Antwerp.		
Poel & Kelly, Inc.....	7,000	7,000

Pontianak

JANUARY 26. By "Teucer," Singapore.		
Various	60,000	60,000
JANUARY 26. By "The Lamba," Singapore.		
Various	300	300
JANUARY 26. By "Bandoeng," Sourabaya.		
Various	194,400	194,400
JANUARY 28. By "Diana Dollar," Singapore.		
Various	202,500	202,500
JANUARY 30. By "Kendall Castle," Singapore.		
Various	169,800	169,800
FEBRUARY 3. By "Agapenor," Singapore.		
Various	62,700	62,700
FEBRUARY 10. By "M. S. Dollar," Singapore.		
Various	220,800	220,800
FEBRUARY 11. By "City of Canton," Singapore.		
Various	71,100	71,100
FEBRUARY 19. By "Gaelic Prince," Singapore.		
L. Littlejohn & Co., Inc.....	56,000	56,000
FEBRUARY 26. By "Calchas," Singapore.		
L. Littlejohn & Co., Inc.....	56,000	
Various	104,200	160,200
FEBRUARY 26. By "Menado," Singapore.		
Various	156,800	156,800
MARCH 2. By "City of Pittsburgh," Singapore.		
L. Littlejohn & Co., Inc.....	56,000	
Various	4,000	60,000
MARCH 6. By "Vechdijk," Belawan-Deli.		
L. Littlejohn & Co., Inc.....	460,000	460,000
MARCH 19. By "Wray Castle," Singapore.		
L. Littlejohn & Co., Inc.....	112,000	
Various	20,000	132,000
MARCH 19. By "Machaon," Singapore.		
L. Littlejohn & Co., Inc.....	68,000	68,000

Gutta Siak

JANUARY 15. By "Kentucky," Singapore.		
Various	300	300
JANUARY 26. By "Teucer," Singapore.		
Various	60,000	60,000
JANUARY 26. By "Bandoeng," Sourabaya.		
Various	13,800	13,800
JANUARY 28. By "Diana Dollar," Singapore.		
Fred Stern & Co., Inc.....	11,245	11,245
JANUARY 30. By "Kendall Castle," Singapore.		
Various	24,000	24,000
FEBRUARY 3. By "Agapenor," Singapore.		
Fred Stern & Co., Inc.....	11,200	
Various	51,800	63,000
FEBRUARY 26. By "Calchas," Singapore.		
Various	43,800	43,800
MARCH 2. By "City of Pittsburgh," Singapore.		
L. Littlejohn & Co., Inc.....	168,000	168,000
MARCH 6. By "Vechtdijk," Belawan-Deli.		
Various	5,100	5,100
MARCH 19. By "Machaon," Singapore.		
L. Littlejohn & Co., Inc.....	56,000	56,000

Gutta Percha

JANUARY 14. By "Pahna," Lagos.		
Various	10,800	10,800
JANUARY 26. "Bandoeng," Sourabaya.		
Various	26,400	26,400
JANUARY 26. By "Teucer," Singapore.		
Various	15,000	15,000
JANUARY 30. By "Kendall Castle," Singapore.		
Various	68,400	68,400
FEBRUARY 3. By "Agapenor," Singapore.		
Various	3,300	3,300
MARCH 2. By "City of Pittsburgh," Singapore.		
L. Littlejohn & Co., Inc.....	56,000	
Poel & Kelly, Inc.....	2,038	
Various	74,862	132,900
MARCH 6. By "Vechtdijk," Belawan-Deli.		
Various	5,700	5,700
MARCH 16. By "Parracoo," Lagos.		
Various	19,800	19,800

Balata

JANUARY 16. By "Gen. G. W. Goethals," Cristobal.		
Various	1,500	1,500
JANUARY 21. By "Calamares," Cristobal.		
Various	2,550	2,550
JANUARY 22. By "Celtic," Liverpool.		
Various	1,050	1,050
JANUARY 28. By "Maraval," Trinidad.		
Various	15,600	15,600
JANUARY 31. By "Colon," Cristobal.		
Various	13,600	13,600
FEBRUARY 2. By "Sixaola," Cristobal.		
Various	900	900
FEBRUARY 4. By "Polycarp," Pará.		
Various	4,950	4,950
FEBRUARY 9. By "Matura," Trinidad.		
Various	13,200	13,200
FEBRUARY 12. By "Barbodian," London.		
Various	3,000	3,000
FEBRUARY 19. By "Prins Frederick Hendrick," Paramaribo.		
Various	1,800	1,800
FEBRUARY 21. By "Mayaro," Cristobal.		
Various	9,300	9,300
FEBRUARY 22. By "Denis," Brazil.		
L. Littlejohn & Co., Inc.....	3,000	3,000
FEBRUARY 22. By "Michael," Pará.		
L. Littlejohn & Co., Inc.....	20,000	20,000
FEBRUARY 23. By "Paria," Paramaribo.		
Middleton & Co., Ltd.....	3,522	
Various	2,778	6,300
FEBRUARY 26. By "Bridgetown," Cartagena.		
Various	1,350	1,350
FEBRUARY 27. By "Cristobal," Cristobal.		
Various	6,000	6,000
MARCH 1. By "Regina," Liverpool.		
Various	3,300	3,300
MARCH 10. By "Virgil," Manáos.		
Paul Bertuch	264	
L. Littlejohn & Co., Inc.....	15,000	15,264
MARCH 10. By "Maraval," Trinidad.		
Middleton & Co., Ltd.....	1,620	
Various	76,080	77,700
MARCH 10. By "Gen. Gorgas," Panama.		
Various	4,200	4,200
MARCH 12. By "Maryland," London.		
Various	2,040	2,040
MARCH 13. By "Valacia," London.		
Various	1,080	1,080
MARCH 15. "Albania," Liverpool.		
Various	10,500	10,500
MARCH 17. By "Dominic," Manáos.		
Various	16,200	16,200

Exports of India Rubber and Caucho from the Amazon During the Year 1922

Exporters	Europe Fine	Europe Medium	Europe Coarse	Europe Caucho	Europe Totals	New York Fine	New York Medium	New York Coarse	New York Caucho	New York Totals	Grand Totals
Berringer & Co., Pará-											
Ohliger & Co. Manáos...*kilos*	2,632,598	244,031	85,250	1,176,680	4,138,559	1,847,462	190,735	724,990	637,234	3,400,421	7,538,980
General Rubber Co. of Brazil, Pará and Manáos.....	1,165,719	68,909	109,865	189,338	1,533,831	1,784,623	231,700	722,537	779,155	3,518,015	5,051,846
Vianna, Lyra & Co. Manáos....	984,516	75,528	197,505	410,908	1,668,457	288,047	29,831	60,066	11,040	388,984	2,057,441
Bitar Irmãs, Pará.....	693,460	30,450	31,522	697,126	1,452,558	234,738	77,972	44,162	84,660	441,532	1,894,090
Suarez Filho & Co., Pará	591,852	5,084	1,551	95,321	693,808	699,271	22,337	13,610	370,693	1,105,911	1,799,719
F. Chamié, Pará	56,126	2,100	8,400	3,000	69,626	636,236	18,684	501,518	91,231	1,247,669	1,317,295
Semper & Co., Manáos-											
Ranniger & Co., Pará	369,974	29,815	26,393	61,027	487,209	83,019	2,811	128,983	40,297	255,110	742,319
Stowell & Co., Pará and Manáos	104,773	16,562	5,908	.....	127,243	121,838	17,370	51,033	85,377	275,618	402,861
Jos. Origet & Co., Pará	354,389	25,787	16,278	20,801	417,255	.....	.....	.....	.....	.....	417,255
J. G. de Araujo, Manáos	185,031	17,004	18,336	4,673	225,044	81,764	18,779	17,018	4,132	121,693	346,732
Amazon River S. N. Co., Pará..	142,691	4,405	16,419	61,781	225,296	9,830	.....	.....	.....	9,830	235,126
Ferreira Costa & Co., Pará....	29	67	48	23	167	131,216	9,022	17,534	53,280	211,052	211,219
B. Levy, Manáos	.....	.....	.....	.....	.....	51,854	6,762	38,002	36,972	133,590	133,590
Tancredo Porto & Co., Manáos.	30,858	5,555	336	213	36,962	2,489	674	62,465	26,616	92,244	129,206
Higson, Jones & Co., Manáos...	55,744	2,984	8,857	59,782	127,367	960	198	20	.....	1,178	128,545
Various	193,097	8,794	725	.....	202,616	36,625	10,455	30,279	9,321	86,680	289,296
	7,560,857	537,075	527,393	2,780,673	11,405,998	6,009,972	637,330	2,412,217	2,230,008	11,289,527	22,695,525
In transit from Iquitos	30,106	.....	404	491	31,001	213,605	2,227	38,963	144,674	299,469	330,470
Totals .....*kilos*	7,590,963	537,075	527,797	2,781,164	11,436,999	6,223,577	639,557	2,451,180	2,374,682	11,588,996	23,025,995

Destinations

	New York	Liverpool	Havre	Hamburg	Brazil (South)	Antwerp	Genoa	Amsterdam and Rotterdam	Lisbon and Oporto	Buenos Ayres	Santiago (Chile)	Total
From Pará .....*kilos*	11,430,386	4,864,329	3,373,229	2,931,673	147,665	136,326	65,010	51,400	15,032	10,240	705	23,025,995

Compiled by Berringer & Co., Para, Brazil.

Exports of India Rubber Manufactures from the

EXPORTED TO—	Belting	Hose	Packing	Thread	Boots		Shoes		Canvas Shoes with Rubber Soles		Soles and Heels	Leather Cloth or Artificial Leather	Waterproofed Auto Cloth
EUROPE	Value	Value	Value	Value	Pairs	Value	Pairs	Value	Pairs	Value	Value	Value	Value
Austria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belgium	$3,110	$6,380	$100	.....	120	$38	91	$84	.....	.....	$49	$3,596	$3,170
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Denmark	613	197	191	.....	1,268	2,823	2,802	3,194	.....	.....	.....	8,470	454
Esthonia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Finland	4,070	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
France	5,468	2,818	812	$8,525	22	52	25	25	888	$638	78	50,657	782
Germany	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Greece	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iceland and Faroe Islands	.....	.....	.....	.....	1,293	3,368	1,299	3,373	.....	.....	.....	.....	.....
Italy	.....	.....	865	5,324	105	128	225	224	.....	.....	.....	3,584	.....
Jugoslavia, Albania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lithuania	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malto, Gozo, etc	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	.....	825	.....	.....	.....	.....	.....	.....	2,160	3,020	596	330	.....
Norway	567	282	.....	.....	847	1,627	2,179	1,581	.....	.....	.....	3,544	353
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portugal	.....	.....	.....	.....	554	725	.....	.....	.....	.....	120	.....	.....
Rumania	.....	183	521	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia in Europe	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain	45	.....	.....	3,903	26	56	733	599	.....	.....	601	1,950	.....
Sweden	535	547	.....	.....	12	11	137	120	.....	.....	428	13,191	.....
Switzerland	476	18	.....	1,456	.....	.....	264	146	1,123	891	.....	321	.....
Turkey in Europe	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
England	890	15,348	2,004	26,302	9,328	19,210	3,658	2,598	81,821	51,662	564	13,779	4,917
Scotland	1,599	.....	524	.....	.....	.....	.....	.....	1,482	859	.....	10,735	.....
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, EUROPE	$17,373	$26,598	$5,017	$45,510	13,475	$28,038	11,413	$11,944	87,474	$57,070	$2,436	$110,157	$9,676
NORTH AMERICA													
Canada—Maritime Provinces	$315	$41	$88	.....	1	$5	10	$12	312	$319	$22	$121	$58
Quebec and Ontario	9,192	8,942	5,323	$2,321	884	3,105	66	200	840	745	2,211	17,922	4,231
Prairie Provinces	869	533	22	.....	24	114	175	555	707	623	.....	.....	.....
Brit. Columbia and Yukon	227	404	186	.....	188	634	28	44	2,112	2,640	.....	156	140
British Honduras	.....	68	.....	.....	.....	.....	18	44	60	86	125	.....	.....
Costa Rica	652	250	22	.....	.....	.....	.....	.....	.....	.....	1,407	798	.....
Guatemala	185	125	.....	.....	.....	.....	.....	.....	960	653	917	.....	.....
Honduras	529	948	297	.....	.....	.....	.....	.....	186	175	833	197	.....
Nicaragua	1,614	19	47	.....	.....	.....	.....	.....	36	40	995	.....	89
Panama	20	4,075	39	.....	.....	.....	150	170	2,724	1,985	619	.....	158
Salvador	520	241	.....	.....	.....	.....	.....	.....	72	52	1,878	.....	.....
Mexico	15,633	11,735	5,702	.....	123	264	794	640	18,879	15,831	13,277	683	1,101
Miquelon and St. Pierre Islands	.....	.....	.....	.....	420	1,233	1,128	688	.....	.....	.....	.....	.....
Newfoundland and Labrador	754	262	93	.....	1,569	4,221	286	203	72	23	987	.....	.....
Bermuda	166	156	13	.....	30	59	25	18	73	111	217	16	.....
Barbados	.....	11	.....	.....	.....	.....	.....	.....	144	97	.....	26	.....
Jamaica	370	119	303	.....	.....	.....	168	151	4,005	3,040	1,679	822	766
Trinidad and Tobago	177	404	60	.....	.....	.....	.....	.....	5	3	25	84	83
Other British West Indies	56	351	.....	.....	.....	.....	84	51	865	795	90	.....	72
Cuba	3,702	12,633	6,745	.....	.....	.....	228	188	32,853	19,682	13,641	4,998	490
Dominican Republic	162	372	1,038	.....	.....	.....	.....	.....	668	549	312	469	175
Dutch West Indies	.....	450	.....	.....	.....	.....	.....	.....	558	438	30	.....	.....
French West Indies	51	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Haiti	.....	20	.....	.....	.....	.....	.....	.....	180	250	305	.....	.....
Virgin Islands of United States	.....	.....	.....	.....	.....	.....	.....	.....	660	358	117	.....	.....
TOTALS, NORTH AMERICA	$35,194	$42,159	$19,978	$2,321	3,239	$9,635	3,160	$2,964	66,971	$48,495	$39,687	$26,292	$7,363
SOUTH AMERICA													
Argentina	$7,808	$3,783	$843	.....	1,500	$5,054	444	$350	128,000	$98,915	$745	$10,208	$10,069
Bolivia	2,371	440	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brazil	4,526	6,107	884	$224	36	92	9	9	45	45	1,983	876	1,258
Chile	5,325	6,306	1,424	.....	.....	.....	2,859	1,572	575	415	.....	804	165
Colombia	92	1,435	641	.....	.....	.....	886	630	2,373	1,805	7,702	1,416	640
Ecuador	.....	117	130	.....	.....	.....	.....	.....	2,400	1,657	.....	.....	.....
British Guiana	.....	.....	.....	.....	.....	.....	.....	.....	1,968	1,465	.....	.....	.....
Dutch Guiana	.....	.....	25	.....	.....	.....	.....	.....	290	295	.....	.....	475
French Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paraguay	1,447	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	.....	718	610	.....	.....	.....	.....	.....	156	258	387	302	396
Uruguay	659	94	69	.....	.....	.....	504	397	6,357	4,645	4,655	162	821
Venezuela	224	1,232	877	.....	.....	.....	.....	.....	.....	.....	855	1,768	317
TOTALS, SOUTH AMERICA	$22,452	$20,232	$5,503	$224	1,536	$5,146	4,702	$2,958	142,164	$109,500	$16,327	$15,536	$14,141
ASIA													
Aden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	$645	$1,439	$235	.....	.....	.....	.....	.....	1,833	$1,570	.....	$10,562	$264
Ceylon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	149	.....
Straits Settlements	.....	110	900	.....	.....	.....	250	.....	1,798	602	$49	.....	.....
Other British East Indies	.....	6,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
China	119	561	83	.....	.....	.....	1,180	$220	1,512	1,178	.....	1,393	4,941
Chosen	.....	.....	.....	.....	.....	.....	1,200	1,187	.....	.....	.....	.....	245
Java and Madura	9,184	597	735	.....	.....	.....	.....	917	1,218	1,257	56	233	914
Other Dutch East Indies	1,093	.....	865	.....	.....	.....	.....	.....	294	218	.....	.....	.....
Far Eastern Republic	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
French Indo-China	.....	.....	.....	.....	.....	.....	.....	.....	576	484	.....	.....	.....
Hejaz, Arabia, etc	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hongkong	.....	4,545	.....	.....	.....	.....	.....	.....	72	46	.....	.....	.....
Japan	1,308	1,903	2,033	$4,159	1,200	$2,068	3,284	4,058	.....	.....	.....	574	753
Palestine and Syria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Persia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Siam	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Turkey in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other Asia	.....	.....	.....	.....	.....	.....	.....	.....	47	67	.....	.....	.....
TOTALS, ASIA	$12,349	$15,155	$4,851	$4,159	1,200	$2,068	5,914	$6,382	7,350	$5,422	$105	$12,911	$7,117

United States by Countries During January, 1923

Waterproofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	All Other Rubber Manufactures Value	Totals Value
$130	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$130
.....	1,576	$21,458	$1,265	$165	.....	370	$580	$16	$417	$565	.....	.....	.....	$1,715	42,708
.....	10	237	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	237
.....	8,495	89,188	1,239	784	.....	4,594	8,657	215	1,053	3,549	.....	.....	.....	1,543	122,170
.....	10	258	.....	.....	.....	20	50	.....	.....	.....	.....	.....	.....	15	323
.....	8	199	.....	.....	.....	2	3	.....	.....	309	.....	.....	.....	.....	4,581
162	952	13,294	.....	.....	.....	37	309	42	2,083	5,802	$9,730	$54	$1,181	8,653	111,165
.....	252	3,906	.....	.....	.....	102	220	.....	.....	.....	.....	.....	.....	75	4,201
.....	874	8,992	245	1,210	.....	385	486	30	43	.....	.....	.....	.....	.....	11,006
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,741
.....	405	5,131	.....	.....	.....	378	522	116	.....	553	.....	.....	.....	932	17,379
.....	709	9,523	.....	.....	.....	1,560	2,875	.....	.....	.....	.....	.....	.....	.....	.....
.....	39	922	.....	.....	.....	20	39	.....	.....	.....	.....	.....	.....	.....	961
.....	45	286	.....	288	.....	.....	.....	.....	27	.....	.....	.....	.....	.....	601
44	1,959	27,382	2,448	.....	$335	1,304	2,170	781	586	1,067	.....	.....	334	2,789	42,711
.....	1,229	19,372	250	1,538	.....	718	1,694	305	195	.....	.....	.....	.....	1,353	32,661
.....	175	1,711	.....	.....	.....	300	473	.....	.....	.....	.....	.....	.....	.....	2,184
.....	7	87	.....	.....	.....	26	36	.....	89	.....	.....	.....	.....	20	1,077
.....	292	5,749	.....	4,268	.....	423	988	.....	.....	.....	.....	.....	.....	463	12,172
.....	.....	.....	.....	2,200	 6	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,200
.....	1,096	14,848	.....	2,165	50	891	1,569	.....	796	.....	29	.....	.....	1,926	28,993
.....	1,215	18,189	.....	509	.....	396	770	.....	620	800	.....	.....	.....	1,529	37,249
375	4	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,412	7,111
.....	120	1,133	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,133
1,615	19,018	197,879	5,933	21,124	.....	6,808	11,454	41	1,194	8,315	.....	10,112	11,384	44,114	450,439
.....	696	7,614	.....	.....	.....	458	1,922	.....	.....	2,395	.....	.....	.....	2,653	28,301
.....	583	4,805	.....	.....	.....	354	498	.....	.....	.....	.....	.....	.....	.....	5,303
$2,326	39,769	$452,179	$11,380	$34,251	$845	19,146	$35,315	$1,546	$7,103	$23,355	$9,759	$10,166	$12,899	$71,192	$986,135
.....	269	$2,324	.....	.....	.....	.....	.....	.....	.....	$58	$43	.....	$308	$839	$4,553
$3,760	1,487	23,776	$805	$8,158	$48	455	$784	$190	$1,792	9,596	14,063	$2,636	7,489	69,441	196,730
69	3,988	21,512	15	1,673	.....	1,315	1,546	13	123	2,663	483	.....	229	3,637	34,678
1,426	88	1,457	91	507	.....	49	98	.....	.....	256	.....	.....	180	2,198	10,644
.....	.....	.....	.....	.....	.....	114	186	.....	.....	.....	.....	.....	.....	41	550
206	87	1,069	.....	.....	.....	.....	.....	.....	21	23	.....	.....	.....	307	4,755
.....	222	4,185	51	.....	.....	123	280	10	.....	68	.....	.....	.....	75	6,549
1,443	109	2,731	32	1,043	.....	18	63	.....	.....	47	.....	.....	120	249	8,707
.....	94	965	.....	.....	.....	124	196	.....	20	177	.....	.....	.....	9	4,171
80	1,285	15,212	526	1,941	640	1,150	1,917	135	207	210	300	159	.....	1,882	30,275
.....	28	541	.....	361	.....	22	48	.....	.....	77	.....	.....	.....	.....	3,718
3,120	5,516	63,475	933	2,181	1,306	6,441	11,234	169	1,693	2,585	.....	2,112	1,770	11,038	166,482
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,921
25	4	60	.....	.....	.....	4	8	.....	.....	83	.....	.....	312	422	7,453
200	.....	.....	.....	.....	327	.....	.....	.....	.....	348	.....	35	.....	256	1,922
64	163	1,823	.....	61	285	166	286	.....	18	.....	.....	.....	.....	17	2,688
.....	610	8,292	.....	3,728	795	524	1,145	.....	.....	75	242	.....	.....	563	22,090
.....	633	8,153	20	526	.....	769	1,281	16	269	.....	.....	75	.....	231	11,407
83	215	2,125	325	.....	121	321	447	.....	17	114	.....	.....	79	188	4,914
3,852	9,449	90,441	7,297	16,651	123	6,760	10,336	285	1,482	4,926	48	.....	110	11,008	208,638
97	711	6,739	491	981	105	900	1,572	22	171	113	.....	.....	9	614	13,991
.....	89	714	31	60	.....	115	164	.....	42	.....	.....	.....	.....	24	1,953
.....	219	2,579	.....	.....	.....	44	89	.....	.....	.....	.....	.....	.....	.....	2,719
68	309	3,876	.....	.....	387	675	1,036	.....	24	.....	.....	.....	.....	21	5,987
.....	26	257	.....	.....	.....	38	82	.....	.....	.....	.....	.....	.....	.....	814
$14,493	25,601	$262,306	$10,617	$37,871	$4,137	20,127	$32,798	$840	$5,879	$21,419	$15,179	$5,017	$10,606	$103,060	$758,310
$1,071	14,927	$133,632	$170	$2,968	.....	8,486	$11,093	.....	$3,097	$4,345	.....	.....	$41	$3,329	$297,521
.....	136	1,959	.....	.....	.....	188	294	.....	.....	.....	.....	.....	.....	.....	5,064
472	6,491	45,117	9,190	3,091	.....	3,858	4,974	.....	546	1,974	.....	.....	479	2,173	84,020
.....	1,994	33,183	.....	308	$1,320	2,019	3,975	.....	123	273	.....	$484	134	1,031	56,842
309	883	13,894	.....	533	469	1,163	2,638	$159	116	375	.....	.....	62	1,162	34,078
.....	139	2,085	.....	.....	.....	208	435	.....	75	.....	.....	38	.....	662	5,199
.....	.....	.....	.....	424	230	107	158	.....	.....	.....	.....	.....	.....	.....	2,277
300	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,095
34	.....	.....	18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52
137	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60	1,644
50	1,559	20,586	.....	1,452	.....	1,438	2,611	.....	43	150	.....	356	.....	1,455	29,374
906	1,203	12,114	.....	.....	.....	464	801	.....	21	1,128	.....	.....	.....	143	26,615
.....	569	5,908	58	133	.....	1,250	2,133	.....	55	.....	.....	.....	200	211	13,971
$3,279	27,901	$268,478	$9,436	$8,909	$2,019	19,181	$29,112	$159	$4,076	$8,245	.....	$878	$916	$10,226	$557,752
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$16	$16
.....	1,426	$12,665	$312	$5,407	$1,740	3,495	$4,486	$32	$214	$316	.....	$103	$679	934	41,603
.....	154	1,412	.....	601	110	513	620	.....	.....	.....	.....	.....	.....	.....	2,892
.....	419	3,635	16	360	75	230	330	.....	32	.....	.....	43	.....	63	6,215
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,000
$712	170	3,479	.....	8,934	.....	112	244	.....	.....	1,031	.....	.....	.....	1,170	24,065
.....	335	3,338	.....	.....	.....	414	503	.....	.....	.....	.....	.....	.....	27	5,300
.....	1,458	17,810	84	12,516	1,943	394	647	410	14	23	.....	.....	.....	1,247	48,587
15	372	5,840	175	1,977	.....	53	113	121	.....	.....	.....	.....	.....	383	10,800
.....	.....	.....	.....	.....	113	.....	.....	.....	.....	.....	.....	.....	.....	.....	113
.....	241	3,659	8	90	.....	210	423	9	.....	.....	.....	.....	.....	.....	4,673
.....	174	1,385	.....	.....	.....	144	181	.....	.....	.....	.....	.....	.....	.....	1,566
120	2	71	.....	.....	.....	20	200	.....	.....	15	.....	123	.....	780	5,900
.....	2,933	28,505	1,092	7,514	.....	308	593	187	17	1,182	.....	.....	.....	4,689	60,635
.....	286	2,675	.....	.....	.....	118	220	.....	124	.....	.....	.....	.....	428	3,447
.....	2	122	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	122
.....	50	607	.....	.....	.....	30	73	.....	.....	.....	.....	.....	.....	.....	680
.....	12	330	.....	.....	.....	16	40	.....	.....	.....	.....	.....	.....	.....	370
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67
$847	8,034	$85,533	$1,687	$37,399	$3,981	6,057	$8,673	$759	$401	$2,567	.....	$269	$679	$9,737	$223,051

Exports of India Rubber Manufactures from the United

	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed Auto Cloth Value
OCEANIA													
Philippine Islands	$8,037	$3,484	$576	.....	12	$52	120	$96	11,788	$10,875	$1,833	$3,138	$478
Australia	8,978	1,350	5,116	.....	132	504	.....	.....	.....	.....	976	16,111	3,892
British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	750	815	.....	.....	.....
French Oceania	.....	.....	.....	.....	.....	.....	24	14	606	731	14	.....	.....
New Zealand	3,839	3,338	1,362	.....	122	320	.....	.....	.....	.....	.....	2,875	809
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	42	88	.....	.....	15
TOTALS, OCEANIA	$20,854	$8,172	$7,054	.....	266	$876	144	$110	13,186	$12,509	$2,823	$22,124	$5,194
AFRICA													
Belgian Kongo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British West Africa	.....	$31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British South Africa	$41,236	13,309	$620	$63	156	$416	431	$295	1,834	$1,530	$1,320	$9,433	$699
British East Africa	2,006	.....	.....	.....	.....	.....	.....	.....	48	48	.....	.....	339
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	275	.....	.....
Egypt	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	288	.....
Algeria and Tunis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other French Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morocco	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	1,615	143	.....	.....	.....	.....	.....	.....	96	75	.....	.....	.....
Other Portuguese Africa	.....	106	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, AFRICA	$44,857	$13,589	$620	$63	156	$416	431	$295	1,978	$1,653	$1,595	$9,721	$1,038
GRAND TOTALS	$153,079	$125,905	$43,023	$52,277	19,872	$46,179	25,764	$24,653	319,123	$234,649	$62,973	$196,741	$44,529

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	October, 1921 Pounds	October, 1921 Value	October, 1922 Pounds	October, 1922 Value
UNMANUFACTURED—*free*				
Crude rubber				
From France	.....	.....	11,072	$1,377
Netherlands	5,869,263	$873,258	161,526	29,624
United Kingdom	5,503,247	871,135	5,511,438	816,702
Canada	3,825	174	.....	.....
Central America	.....	.....	4,117	325
Brazil	2,261,612	269,776	2,512,825	312,084
Peru	.....	.....	51,973	17,246
Other South America	80	16	4,162	668
British East Indies	28,824,896	3,772,554	56,078,003	7,468,541
Dutch East Indies	4,276,970	783,050	8,499,473	1,390,902
Other countries	902,410	124,455	1,480,594	151,632
Totals	47,642,303	$6,694,418	74,315,183	$10,189,101
Balata	176,684	88,953	156,320	84,847
Jelutong (Pontianak)	273,585	20,730	118,931	10,849
Gutta percha	118,657	15,542	88,858	11,294
Rubber scrap	318,240	12,880	535,810	21,264
Totals, unmanufactured	48,529,469	$6,832,523	75,215,102	$10,217,355
Chicle *dutiable*	474,007	$255,961	.....	.....
MANUFACTURED—*dutiable*				
Rubber belting	.....	.....	29,099	$23,635
Other manufactures of and substitutes for rubber	.....	$95,186	.....	66,278

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	123,100	$13,951	182,858	$16,408
Scrap and old	814,192	42,150	597,510	20,522
Footwear				
Boots[1] *pairs*	11,108	28,382	20,472	46,210
Shoes[1] *pairs*	187,054	171,760	161,638	155,122
Canvas shoes with rubber soles[1] *pairs*	.....	.....	225,941	170,501
Druggists' rubber sundries[1]	.....	53,356	92,323	90,459
Hard rubber goods				
Battery jars and accessories[1]	.....	.....	17,537	5,643
Other electrical supplies[1]	.....	.....	20,963	9,100
Other hard rubber goods[1]	.....	.....	40,073	42,904
Tires				
Pneumatic casings				
For automobiles[1]	.....	1,239,589	113,000	1,416,055
Other[1]	.....	.....	4,512	17,761
Pneumatic tubes				
For automobiles[1]	.....	71,530	73,810	151,208
Other[1]	.....	.....	3,546	4,632
Solid Tires				
For automobile and motor trucks[1]	.....	136,149	4,896	126,729
Other[1]	.....	.....	45,070	11,555
All other tires[1]	.....	21,574	.....	.....
Tire repair materials[1]	.....	.....	57,685	22,381
Belting[1]	.....	173,038	289,771	148,532
Hose[1]	.....	81,664	271,610	103,537
Packing[1]	.....	51,434	119,781	53,484
Soles and heels[1]	.....	32,546	181,003	65,885
Thread[1]	.....	.....	91,935	102,854
Other rubber manufactures[1]	.....	351,026	404,391	175,156
Totals, manufactured	.....	$2,467,649	.....	$2,956,638

Exports of Foreign Merchandise

	October, 1921 Pounds	October, 1921 Value	October, 1922 Pounds	October, 1922 Value
UNMANUFACTURED				
India rubber	1,419,324	$205,141	486,737	$90,051
Balata	193,751	93,382	22,843	9,004
Jelutong (Pontianak)	234,063	31,015	.....	.....
Totals, unmanufactured	1,847,138	$329,538	509,580	$99,055
MANUFACTURED				
Gutta percha and India rubber	.....	$48,646	.....	$128
India rubber substitutes	.....	.....	.....	.....
Totals, manufactured	.....	$48,646	.....	$128

[1]Details of exports of domestic merchandise by countries during October, 1922, appeared on pages 260 to 263 of our January, 1923, issue.

Custom House Statistics

New York

Imports

	October, 1921 Pounds	October, 1921 Value	October, 1922 Pounds	October, 1922 Value
UNMANUFACTURED—*free*				
Crude rubber				
From Azores	.....	.....	11,200	$2,240
Belgium	108,250	$17,889	1,469,394	149,392
Italy	157,000	26,389	.....	.....
France	.....	.....	11,072	1,377
Netherlands	5,869,263	873,258	157,166	28,947
England	5,424,777	864,100	5,308,023	794,717
Nicaragua	.....	.....	1,497	220
Brazil	2,261,612	269,776	2,512,825	312,084
Colombia	80	16	4,162	668
Peru	.....	.....	51,973	17,246
British India	100,830	11,895	256,438	36,301
Ceylon	.....	.....	12,067,505	1,565,781
Straits Settlements	21,894,995	2,775,068	40,653,537	5,452,626
Java	.....	.....	3,787,572	706,243
British East Indies	4,954,713	656,387	.....	.....
Dutch East Indies	4,234,406	777,768	4,599,797	668,845
Japan	629,076	78,476	.....	.....
Belgian Kongo	7,624	1,605	.....	.....
Guatemala	.....	.....	2,620	105
Totals	45,642,616	$6,352,627	70,894,781	$9,736,792
Balata	176,684	88,953	156,320	84,847
Jelutong (Pontianak)	273,585	20,730	118,931	10,849
Gutta percha	118,657	15,542	88,322	11,223
Totals	46,211,542	$6,477,852	71,258,354	$9,843,711
Rubber, scrap and reclaimed	116,915	8,201	242,839	16,735
Totals, unmanufactured	46,328,457	$6,486,053	71,501,193	$9,860,446
MANUFACTURED				
Rubber belting for machinery, *dutiable*	.....	.....	11,959	$11,371
Other manufactures of rubber and substitutes *dutiable*	279,358	$237,124	.....	43,802
Chicle *dutiable*	.....	54,955	$91,677	313,691

States by Countries During January, 1923—*Continued*

	Waterproofed Clothing	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others	Solid Tires: Automobile	Solid Tires: Others	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others	Tire Repair Materials	Druggists' Rubber Sundries	Hard Rubber Goods: Battery Jars and Accessories	Hard Rubber Goods: Other Electrical Supplies	Hard Rubber Goods: Others	All Other Rubber Manufactures	Totals
	Value		Value	Value	Value	Value		Value	Value	Value	Value	Value	Value	Value	Value	Value
	$13	3,887	$45,873	$704	$2,674	.....	3,084	$5,633	$527	$2,099	$314	$30	.....	$349	$3,127	$89,912
	1,712	4,898	73,793	3,311	26,129	$129	1,129	2,419	90	997	1,678	91	.....	338	3,036	150,650
	225	12	143	.....	.....	.....	12	24	.....	.....	.....	.....	.....	17	.....	1,224
	54	17	251	18	.....	18	4	7	.....	.....	.....	.....	.....	.....	.....	1,107
	315	8,318	97,606	1,423	30,533	.....	4,013	6,584	673	1,017	92	.....	.....	.....	916	151,702
	.....	10	204	76	.....	.....	36	63	30	.....	.....	.....	.....	.....	.....	476
	$2,319	17,142	$217,870	$5,532	$59,336	$147	8,278	$14,730	$1,320	$4,113	$2,084	$121	.....	$704	$7,079	$395,071
	.....	.....	.....	$29	.....	.....	.....	.....	$10	.....	.....	.....	.....	.....	.....	$39
	.....	1,995	$33,247	897	.....	.....	2,568	$6,396	.....	$38	.....	.....	.....	.....	$31	40,640
	$2,872	4,213	43,757	72	$3,095	.....	4,244	6,018	237	2,764	$167	.....	.....	$202	2,656	130,761
	.....	695	6,326	.....	60	.....	265	597	.....	.....	.....	.....	.....	.....	82	9,458
	170	152	1,706	.....	1,071	.....	129	175	.....	.....	.....	.....	.....	.....	.....	3,397
	.....	753	4,609	112	.....	.....	448	829	100	6	.....	.....	.....	.....	421	6,365
	.....	71	643	.....	.....	.....	70	93	.....	.....	.....	.....	.....	.....	.....	736
	.....	73	832	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	832
	.....	.....	.....	.....	1,811	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,811
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,833
	.....	51	731	.....	.....	.....	34	56	.....	.....	.....	.....	.....	.....	.....	893
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37	37
	$3,042	7,733	$91,851	$1,110	$6,037	.....	7,758	$14,164	$347	$2,808	$167	.....	.....	$202	$3,227	$196,802
	$26,306	126,180	$1,378,217	$39,762	$183,803	$11,129	80,547	$134,792	$4,971	$24,380	$57,837	$25,059	$16,330	$26,006	$204,521	$3,117,121

Exports

	October, 1921 Pounds	October, 1921 Value	October, 1922 Pounds	October, 1922 Value
Manufactured				
Rubber, scrap and reclaimed.	$82,794	$33,826	396,071	$17,733
Automobile and other tires, *number*	.....	1,217,052	128,494	1,270,314
Inner tubes .....*number*	.....	58,217	60,026	109,627
Tire repair materials	.....	.....	38,307	16,036
Boots and shoes.....*pairs*	164,515	146,573	145,837	159,621
Canvas shoes with rubber soles .....*pairs*	.....	.....	181,943	132,215
Soles and heels.....	.....	23,843	117,568	45,083
Battery jars and accessories..	.....	.....	14,885	4,115
Other electrical supplies.....	.....	.....	17,494	7,561
Other hard rubber goods....	.....	.....	29,757	27,984
Druggists' rubber sundries...	.....	27,802	72,183	71,354
Belting, hose and packing....	.....	246,147	470,702	203,102
Thread	.....	.....	50,721	63,106
Other rubber manufactures...	.....	196,284	146,399	88,943
Totals, manufactured....	.....	$1,915,918	.....	$2,216,794

Foreign Exports

Crude rubber	9,236	$1,700	16,214	$7,847
Balata	193,721	93,372	22,843	9,004
Gutta percha	.....	.....	560	269
Rubber, scrap and reclaimed.	.....	.....	2,296	195
Rubber manufactures	.....	1,053	.....	98
Chicle	.....	.....	.....	.....

Imports of Crude Rubber Into the United States by Customs Districts

	November, 1921 Pounds	November, 1921 Value	November, 1922 Pounds	November, 1922 Value
Massachusetts	485,967	$52,706	768,872	$99,031
New York	50,989,243	7,614,637	50,863,548	7,358,860
Maryland	.....	.....	448,000	61,146
New Orleans	.....	.....	145	30
Los Angeles	.....	.....	1,663,472	215,203
San Francisco	254,860	33,937	305,083	50,575
Oregon	.....	.....	11,200	1,659
Michigan	.....	.....	151,267	35,977
Colorado	.....	.....	132,072	15,370
Washington	1,114	1,381	.....	.....
Totals	51,731,184	$7,702,661	54,343,659	$7,837,851

Rubber Exports from British Malaya

An official telegram from Singapore states that the exports of rubber from British Malaya in the month of February amounted to 44,593,300 pounds (19,910 tons), as against 22,871 tons in January and 20,033 tons in the corresponding month of last year.

Foreign imports into British Malaya amounted to 9,158,800 pounds (4,089 tons) in the month of February.

Appended are the comparative statistics:

	1922	1923
January	18,962	22,871
February	20,033	19,910
Total	38,995	42,781

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	December, 1921 Pounds	December, 1921 Value	December, 1922 Pounds	December, 1922 Value
Unmanufactured—*free*				
Rubber, gutta percha, etc.				
From United Kingdom	70,762	$10,901	.....	.....
United States	923,970	188,809	1,107,815	$248,974
British East Indies Straits Settlements...	267,939	38,602	201,562	26,533
Totals	1,262,671	$238,312	1,309,377	$275,507
Rubber, recovered	178,565	21,821	297,929	23,185
Rubber, powdered, and rubber or gutta percha scrap	173,875	10,386	306,979	6,053
Balata	.....	.....	2,255	625
Rubber substitutes	9,416	2,419	16,843	3,233
Totals, unmanufactured..	1,624,527	$272,938	1,933,383	$308,603
Partly Manufactured				
Hard rubber sheets and rods....	436	$569	929	$675
Hard rubber tubes	.....	2,739	.....	3,683
Rubber thread not covered.....	8,473	9,957	8,818	9,353
Total, partly manufactured	8,909	$13,265	9,747	$13,711
Manufactured				
Belting	.....	$5,064	.....	$21,408
Hose	.....	8,934	.....	7,179
Packing	.....	4,508	.....	4,070
Boots and shoes.....*pairs*	.....	7,767	4,301	10,680
Clothing, including waterproofed	.....	5,904	.....	11,614
Gloves	.....	799	.....	1,137
Hot water bottles	.....	890	.....	1,088
Tires, solid	.....	6,176	.....	10,117
Tires, pneumatic	.....	57,365	.....	41,652
Inner tubes	.....	8,747	.....	6,309
Elastic, round or flat.....	.....	21,854	.....	20,165
Mats and matting	.....	499	.....	433
Cement	.....	5,282	.....	5,909
Other rubber manufactures.....	.....	81,377	.....	71,353
Totals, manufactured	.....	$215,166	.....	$213,114
Totals, rubber imports....	1,633,436	$501,369	1,943,130	$535,428

Exports of Domestic and Foreign Rubber Goods

	December, 1921 Produce of Canada Value	December, 1921 Reexports of Foreign Goods Value	December, 1922 Produce of Canada Value	December, 1922 Reexports of Foreign Goods Value
Unmanufactured				
Crude and waste rubber.....	$8,571	$608	$23,482	$58,048
Manufactured				
Belting	$5,045	.....	$11,431	.....
Canvas shoes with rubber soles..	33,585	.....	44,432	.....
Boots and shoes .....*pairs*	42,645	.....	36,055	.....
Clothing, including waterproofed.	675	.....	602	.....
Hose	8,881	.....	7,366	.....
Tires, casings	.....	.....	518,722	.....
inner tubes	.....	.....	42,528	.....
pneumatic	283,882	.....	.....	.....
solid	8,072	.....	5,918	.....
vehicle	.....	$6,442	.....	$1,568
Other rubber manufactures	31,855	2,045	16,815	6,928
Totals, manufactured	$414,640	$8,487	$683,869	$8,496
Totals, rubber exports....	$423,211	$9,095	$707,351	$66,544

United Kingdom Rubber Statistics

Imports

Unmanufactured	January, 1922 Pounds	January, 1922 Value	January, 1923 Pounds	January, 1923 Value
Crude rubber				
From—				
Straits Settlements	3,205,700	£128,764	6,101,400	£306,302
Federated Malay States	3,895,200	279,538	1,506,500	81,057
British India	995,400	45,352	828,600	42,552
Ceylon and Dependencies	2,298,900	107,556	2,417,900	109,584
Other Dutch Possessions in Indian Seas	566,500	26,359	84,000	4,833
Dutch East Indies (except other Dutch Possessions in Indian Seas)	515,000	22,443	1,153,600	56,412
Other Countries in East Indies and Pacific, not elsewhere specified	221,200	10,862	69,800	4,337
Brazil	696,300	36,383	1,130,700	62,701
South and Central America (except Brazil and Peru)	9,300	370	5,600	150
West Africa				
French West Africa	9,800	328	66,400	3,335
Other Parts of West Africa	39,500	1,448	16,600	513
East Africa, including Madagascar	59,500	2,182	47,600	2,561
Other countries	93,000	2,483	75,100	3,380
Totals	14,605,300	£664,068	13,503,800	£677,717
Waste and reclaimed rubber	53,400	706	92,500	871
Gutta percha and balata	907,400	147,206	1,235,100	181,392
Rubber substitutes	13,200	280	2,200	49
Totals, unmanufactured	15,579,300	£812,260	14,833,600	£860,029
Manufactured				
Boots and shoes....*doz. pairs*	6,568	£15,341	14,809	£32,795
Tires and tubes				
Pneumatic				
Outer covers	.....	211,948	.....	230,880
Inner tubes	.....	17,542	.....	25,685
Solid tires	.....	12,313	.....	9,953
Other rubber manufactures	.....	59,718	.....	87,858
Totals, manufactured	.....	£316,862	.....	£387,172

Exports

Unmanufactured				
Waste and reclaimed rubber	686,500	£10,924	789,000	£8,215
Rubber substitutes	53,200	1,451	143,200	2,975
Total, unmanufactured	739,700	£12,375	932,200	£11,190
Manufactured				
Boots and shoes....*doz. pairs*	6,604	£14,065	14,801	£26,832
Tires and Tubes				
Pneumatic				
Outer covers	.....	104,734	.....	143,203
Inner tubes	.....	21,610	.....	23,602
Solid tires	.....	23,505	.....	30,722
Other rubber manufactures	.....	216,030	.....	265,356
Totals, manufactured	.....	£379,944	.....	£489,715

Exports—Colonial and Foreign

Unmanufactured	January, 1922 Pounds	January, 1922 Value	January, 1923 Pounds	January, 1923 Value
Crude rubber				
To Sweden, Norway and Denmark	28,800	£1,306	77,100	£4,129
Germany	1,682,400	70,215	2,259,200	112,646
Belgium	210,000	9,230	263,600	15,031
France	3,627,200	161,528	2,517,900	145,243
Spain	104,400	4,814	60,800	3,691
Italy	420,500	19,895	776,600	39,521
Austria	45,500	2,050	.....	.....
Hungary	2,700	112	.....	.....
Other European countries	145,500	6,450	394,900	19,244
United States	12,678,000	558,842	1,745,400	85,058
Canada	86,400	4,370	2,200	150
Other countries	2,400	117	35,000	1,729
Totals	19,033,800	£838,929	8,132,700	£426,442
Waste and reclaimed rubber	.....	.....	3,600	57
Gutta percha and balata	73,200	11,402	75,000	12,489
Rubber substitutes	2,400	69	.....	.....
Totals, unmanufactured	19,109,400	£850,400	8,211,300	£438,988
Manufactured				
Boots and shoes....*doz. pairs*	916	£2,386	107	£348
Tires and Tubes				
Pneumatic				
Outer covers	.....	51,694	.....	9,962
Inner tubes	.....	1,324	.....	1,110
Solid tires	.....	162	.....	874
Other rubber manufactures	.....	4,391	.....	3,740
Totals, manufactured	.....	£59,957	.....	£16,034

The Market for Rubber Scrap

New York

The improvement in rubber scrap prices noted a month ago has not since been maintained. Dealers have vainly tried to elicit commensurate bids on the part of reclaimers, but have been steadily refused. Prices quoted were strong and firm and below the intrinsic worth of the materials the last week in February, and by the middle of March fell below the earlier levels, reclaimers possibly counting on heavy spring collections of scrap to still further lower prices.

Boots and Shoes. Boots and shoes were quite active the last of February in deliveries to reclaimers but later fell off because of impossible bids.

Hose. There is a moderate demand for air-brake hose at very low prices. Other grades are not in request.

Inner Tubes. Prices have declined in marked degree. Dealers' bids cannot be met.

Mixed Tires. The same market course of lessened demand and falling prices has prevailed with tire as with footwear scrap, eventuating finally in dealers' bids of $1.00 a ton or between 95 cents and $1.05 per hundred, Akron delivery.

Quotations for Carload Lots Delivered

March 26, 1923

Prices subject to change without notice

Boots and Shoes		
Boots and shoes, black	*lb.*	$0.03½ @ $0.04
Trimmed arctics	*lb.*	.03 @ .03¼
Untrimmed arctics	*lb.*	.02¼ @ .03
Hard Rubber		
Battery jars, black compound	*lb.*	.01¾ @ .02
No. 1 scrap	*lb.*	.09 @ .10
Inner Tubes		
No. 1	*lb.*	.06 @ .06½
Compound red	*lb.*	.04½ @ .05
Mechanicals		
Black scrap, mixed	*lb.*	.01½ @
Heels	*lb.*	.01½ @ .02
Horse-shoe pads	*lb.*	.03 @ .03½
Hose, air brake	*lb.*	.01½ @ .01¾
regular	*lb.*	.01 @
Red, scrap, mixed	*lb.*	.02 @ .03
White scrap, mixed	*lb.*	.02 @ .03
Tires		
Pneumatic		
Auto peelings	*lb.*	.01½ @ .02
Bicycle	*lb.*	.01 @ .01¼
Standard white auto	*lb.*	.01½ @ .02
Mixed auto	*lb.*	.01 @ .01¼
Stripped, unguaranteed	*lb.*	*.01 @
Solid		
Carriage	*lb.*	.02 @ .02¼
Irony	*lb.*	.075 @ .01
Truck, clean	*lb.*	.02½ @ .02¾

*Nominal.

Plantation Rubber Exports from Java and Madura, 1921-1922

	December 1921	December 1922	Twelve Months Ended December 31 1921	Twelve Months Ended December 31 1922
To Netherlands and Netherlands f. o. ..*kilos*	315,000	152,000	5,315,000	3,164,000
Great Britain	253,000	649,000	7,307,000	4,947,000
Germany	100,000	78,000	703,000	1,234,000
Other Europe	.....	.....	.....	429,000
United States	1,101,000	1,547,000	12,544,000	19,255,000
Australia	6,000	.....	217,000	93,000
Singapore	235,000	54,000	2,854,000	2,408,000
Japan	.....	.....	281,000	131,000
Other countries	16,000	.....	177,000	.....
Total .....*kilos*	2,026,000	2,480,000	29,398,000	31,661,000
Ports of Origin:				
Tandjong Priok....*kilos*	310,000	962,000	12,942,000	13,890,000
Samarang	122,000	103,000*	556,000	885,000
Soerabaya	845,000	1,154,000	13,543,000	14,772,000

The Market for Cotton and Other Fabrics

New York

American Cotton. The market fluctuations of New York spot middlings for the month, beginning with February 23, were not as extreme as during the month previous. From 29.4 cents on that date the trend was consistently upward till 31.3 was reached on February 19, with but one marked recession, to 30.75, attained for three days between the 10th and 15th of the month. The peak price reached on the 19th was promptly followed by a drop of 75 points. March 26 the market was 29.55 cents, a drop of 65 points from the next preceding quotation.

New crop acreage is somewhat prematurely set at 40,000,000 acres. Need is clearly evident for a crop of 13,000,000 bales to be grown this year to meet consuming needs. The Department of Commerce reports domestic consumption of raw cotton for last February as 556,924 bales, which exceeds the previous high of February, 1917, by 9,750 bales. Cotton consumption was greater than production in 1921-22 and 1922-23.

Egyptian Cotton. Boston quotation for Medium Sakellaridis was 35⅞ cents on February 21, and advanced during the month to 37½, while Medium Uppers on the same dates were quoted at 34⅛ and 35⅜, respectively.

On March 7 the Alexandria stock was a little under that for the same time in 1922, despite the fact that receipts to that date were approximately 1,500,000 cantars ahead of the season of 1921-22. It is estimated that this year's cotton crop will be from 5 to 5½ million cantars. Last season's carryover and about 1,000,000 cantars in the interior bring total Alexandria stocks to about 6,250,000 cantars.

Sea Island. Average extra choice is quoted about 40 cents. There is very little being planted. As a growth Sea Island cotton is being abandoned.

Arizona Cotton. Since February 21 No. 1 and No. 2 grades have each advanced ½ cent. No. 1 is quoted at 39 cents and No. 2 at 38 cents and reported firmer in sympathy with the advance in domestic futures and Sak.

The Phoenix, Arizona, stock is about 25,000 bales, and it is estimated in that market that there will be no marked reduction in the acreage to be planted to Pima this season.

Cotton Fabrics

Ducks, Drills and Osnaburgs. Trade demand has continued strong during the past month. Prices have shown substantial advances as predicted a month ago. The production of the best makes has been taken up to or through June.

Raincoat Fabrics. Business in the raincoat fabric trade has been dull the past month but the situation is improving with a buying movement on at the present time to cover spring requirements.

Sheetings. The sheetings market is still firm but buying activity has slowed down very materially, probably because of the prevailing high prices.

Hollands. The market is quiet and advances are likely.

Tire Fabrics. Trade is still active although most manufacturers have secured their requirements up to June. Prices in all grades and weights are advanced somewhat over the quotations reported a month ago except in the case of 17¼ ounce combed Sakellaridis, which has declined.

In some quarters tire makers are slow to appreciate the impending world shortage of cotton of all qualities and are holding back for lower prices. They will probably not realize the seriousness of the situation except by the forceful argument of still higher prices.

New York Quotations

March 26, 1923

Prices subject to change without notice

Burlaps			
40—7-ounce	100 yds.	$7.20	@$7.25
40—7½-ounce		7.40	@ 7.45
36—8-ounce		6.60	@ 6.65
40—8-ounce		7.50	@ 7.55
40—10-ounce		8.80	@ 8.85
40—10½-ounce		8.85	@ 8.90
Drills			
38-inch 2.00-yard	yard	.28½	@
40-inch 3.47-yard		.16½	@
52-inch 1.90-yard		.31⅜	@
60-inch 1.52-yard		.39½	@
Duck			
CARRIAGE CLOTH			
38-inch 2.00-yard	yard	.29	@
40-inch 1.47-yard		.39½	@
72-inch 16.66 ounce		.63½	@
72-inch 17.21-ounce		.65½	@
MECHANICAL			
Hose	pound	.50	@
Belting		.49	@
Osnaburgs			
40-inch 2.35-yard	yard	.24¾	@
40-inch 2.48-yard		.24¼	@
40-inch 3.00-yard		.19⅜	@
37½-inch 2.42-yard		.24	@
Tennis			
51-inch 1.35-yard	yard	.44½	@
Hollands			
DEAD FINISH			
Standard, 37-inch, white and colors	yard	.20	@
42-inch, white and colors		.24	@
FLAT FINISH			
Imperial, 36-inch, white and colors		.16	@
40-inch, white and colors		.18	@
Raincoat Fabrics			
COTTON			
Bombazine 64 x 60	yard	.15	@
60 x 48		.13	@
Cashmeres, cotton and wool, 36-inch, tan		.29	@
Plaids 60 x 48		.14½	@
56 x 44		.13¾	@
Surface prints 60 x 48		.15¼	@
64 x 60		.16¼	@
Sheetings, 40-inch			
48 x 48, 2.50-yard	yard	.20	@
48 x 48, 2.85-yard		.17¾	@
64 x 68, 3.15-yard		.17	@
56 x 60, 3.60-yard		.15¼	@
48 x 44, 3.75-yard		.13¾	@
44 x 44, 5.50-yard		.10¼	@
Sheetings, 36-inch			
48 x 48, 5.00-yard	yard		@
40 x 40, 6.00-yard			@
44 x 40, 6.00-yard			@
Silks			
Canton, 38-inch	yard	.37½	@
Schappe, 35-inch		.50	@
Tire Fabrics			
BUILDING			
17¼-ounce Sakellaridis, combed	pound	.80	@
17¼-ounce Egyptian, combed		.75	@
17¼-ounce Egyptian, carded		.69	@
17¼-ounce Peeler, carded		.66	@
CORD			
15-ounce Egyptian, combed	pound	.78	@
15-ounce Egyptian, carded		.72	@
2½-pick Peeler, carded		.69	@
BICYCLE			
8-ounce American	pound		@
10-ounce American			@
BREAKER			
Leno, Peeler, carded		.66	@
CHAFER			
9¼-ounce Egyptian, carded	pound	.77	@
9¼-ounce Peeler, carded		.73	@

The Market for Chemicals and Compounding Ingredients

New York

In all lines of rubber compounding ingredients trade has been active at firm or advancing prices. Inadequate railway transportation facilities with consequent freight embargoes continue to seriously hamper the movement of stocks from producer to consumer. French occupation of the Ruhr is forcing manufacturers of lithopone into dependence on domestic sources of barytes. The impending shortage has already affected costs of production and induced an advance in price to consumers of lithopone.

Aniline. A month ago the market was fairly steady at 16½ to 17 cents. As demand increased, shortage of supply developed into consequent firmness in the price.

Barytes. Continued inadequate railway shipping facilities require double the normal time for delivery to all market points for domestic barytes. Importations of barytes from the Ruhr, which is the chief source of the foreign supply, has ceased because of the French occupation. These conditions have caused a serious curtailment of supply to meet very active consuming requirements, consequently the price of barytes advanced $2 a ton about the middle of the month.

Benzol. Supplies are ample for requirements of consumers and prices have held steady throughout the month.

Blanc Fixe. Early in the month trade improved without an advance in price and stocks were sold ahead. An increase in price is expected shortly.

Carbon Black. As for many months past, the full capacity output of this pigment has been sold ahead under contract at firm prices. Production and deliveries are therefore the chief concern of the manufacturers.

China Clay. Poor rail facilities in the southern producing sections, where the important sources of supply are located, and inconvenient embargoes in northern consuming sections are the chief drawbacks met with by producers of china clay. The material is well established in the estimation of rubber goods manufacturers in such lines as tires, heels and many mechanical goods, particularly as an inexpensive toughener and wear-resisting material for general use.

Dry Colors. Business in all dry colors for paint and rubber purposes has been maintained at good volume and satisfactory prices.

Litharge. This important ingredient in rubber compositions is passing into consumption at a brisk rate, particularly in tire, footwear, heels, and mechanicals. Price holds firm.

Lithopone. In spite of the lively demand, which persists without diminution, makers of lithopone were cautious early in the month about increasing prices as further advance would bring in the competing Belgian product. However, the continuing shortages and increase in price of spelter and barytes have raised the cost of manufacture of lithopone, finally forcing an advance of ½ cent a pound on lithopone about the middle of the month. Makers are well sold up to the middle of the year and stock is passing rapidly into the rubber industry.

Sublimed Lead. An advance in price of ¼ cent a pound materialized early in the month, induced by the excessive requirements of consumers in all lines, including the rubber manufacturers who have been actively seeking supplies.

Sulphur. Sulphur, like whiting and other rubber makers' staple supplies, is moving steadily and in routine way at essentially stabilized prices.

Talc. Domestic, French, and Italian grades are in active request at firm prices.

Solvent Naphtha. There exists a persistent shortage in this material which is basic with the proofing trade. The prices are therefore firm, inviting substitution of other and cheaper naphtha.

Whiting. No price changes are noted in this material, which is in steady demand as the compounders' cheap inert filler.

Zinc Oxide. Production is reported sold ahead for six months. The increasing scarcity of spelter has finally influenced the cost of oxide to the point where an advance in price of the product has been necessary. The advance made was ½ cent a pound, effective about the middle of the month. French process oxide is especially preferred by tire manufacturers and is in very active demand by them.

Accelerators, Inorganic

Lead, carbonate	lb.	$0.09¼	@
Lead, red	lb.	.11⅔	@
sublimed blue	lb.	.09¼	@
sublimed white	lb.	.09¼	@
Lime, flour, superfine	lb.	.02	@ .02½
Litharge, domestic	lb.	*.08½	@ .11
imported	lb.	*.17	@
Magnesia, carbonate, light	lb.	.07¾	@ .08¼
calcined, light (bbls.)	lb.	.23	@ .24
calcined, ex. light (bbls.)	lb.	.45	@
calcined, md. light (bbls.)	lb.	.15	@
calcined, heavy (bbls.)	lb.	.05	@
oxide, heavy	lb.		@
Orange mineral A. A. A.	lb.	.14½	@

Accelerators, Organic

Accelerene (f. o. b. English port)	lb.	13s.	@
Accelemal	lb.	.35	@
Aldehyde ammonia crystals	lb.	.90	@ .95
Aniline (f. o. b.) factory	lb.	.16¼	@
Cryline	lb.	.70	@
Diphenylguanidine	lb.		@
Ethylidene aniline	lb.	.70	@ .75
Excellerex	lb.		@
Formaldehyde aniline	lb.	.50	@ .52½
H. R.	lb.	1.40	@ 1.50
Hexamethylene tetramine	lb.	.95	@ .97½
Lead oleate (bbls.)	lb.	.19	@
Methylene aniline	lb.	.48	@
Methylene paratoluidine	lb.	1.40	@
No. 500 Rubber	lb.		@

*Nominal.

New York Quotations

March 26, 1923

No. 801 Rubber	lb.	$0.80	@$0.82
No. 999	lb.	.18	@
Paradin	lb.	.36½	@
Paraldehyde	lb.	.17	@ .19
Paranitrose dimethylaniline Base	lb.	1.30	@
Paraphenylene diamine	lb.	1.55	@ 1.60
Super-sulphur, No. 1	lb.	.50	@ .60
No. 2	lb.	.25	@ .30
Super-X	lb.	.40	@
Super-XX	lb.		@
Tetramethylthiuramdisulphide	lb.	6.00	@
Thiocarbanilide	lb.	.27	@ .30
Vul-Ko-Cene	lb.		@
XLO	lb.		@

Acids

Acetic 28% (bbls.)	cwt.	$3.17½	@$3.92½
glacial, 99%	cwt.	12.05	@12.85
Cresylic (97% straw color)	gal.	1.50	@ 1.60
(95 dark)	gal.		@
Sulphuric, 66 degrees	ton	14.00	@16.00

Alkalies

Caustic soda	lb.	.03¼	@

Colors

BLACK

Bone, powdered	lb.	$0.07	@$0.09
Carbon black	lb.	.23	@ .30
pressed	lb.		@
Dipped goods	lb.		@
Drop	lb.	.07½	@ .16
Gritless black	lb.	.40	@
Hyposulphite of lead	lb.	.22	@ .23
Ivory black	lb.	.15	@ .45
Lampblack	lb.	.12	@ .40
Micronex	lb.		@

BLUE

Cobalt	lb.	.21	@ .26
Dipped goods	lb.		@
Gritless blue	lb.	3.50	@
Prussian	lb.	.55	@ .60
Ultramarine	lb.	.15	@ .35

BROWN

Iron Oxide	lb.		@
Sienna, Italian	lb.	.05½	@ .14¼
Umber, Turkey	lb.	.04	@

GREEN

Chrome, light	lb.	.35	@
medium	lb.	.40	@
dark	lb.	.45	@
commercial	lb.	.12	@
tile	lb.	.13	@ .15
Dipped goods	lb.		@
Gritless green	lb.	3.50	@
Guignet	lb.		@
Oxide of chromium	lb.	.55	@ .67

Chemical Market—*Continued*

New York Quotations

March 26, 1923

Colors—*Continued*

RED			
Antimony, crimson, T. K.	lb.	$0.49	@$0.50
crimson, 15/17% free	lb.	.38	@ .44
crimson, R.M.P. No. 3	lb.	.50	@
crimson F	lb.	.35	@
red sulphuret, free, F.S.	lb.	.45	@
Antimony, golden, T. K.	lb.	.23	@ .35
golden R.M.P. No. 7	lb.	.21	@
golden, 15/17% free	lb.	.18½	@ .22
golden, No. 1	lb.	.30	@
golden, No. 2	lb.	.20	@
7-A	lb.	.35	@
vermilion, T. K.	lb.	.55	@
vermilion 15/17% F. S.	lb.	.50	@
vermilion 5% F. S.	lb.	.65	@
red sulphuret	lb.	.20	@
Arsenic sulphide, red	lb	.15¼	@
lemon	lb.	.75	@ 1.00
orange	lb.	.75	@ 1.00
Cadmium sulphide, red	lb.		@
Dipped goods red	lb.		@
purple	lb.		@
orange	lb.		@
Gritless red (four shades)	lb.	3.50	@
purple	lb.	2.50	@
Indian	lb.	.08	@ .12
Indian maroon, English	lb.	.12½	@
Iron oxide, reduced	lb.	.05	@ .12
pure bright	lb.	.14	@
Maroon oxide	lb.	.08	@ .12
Red oxide, crimson	lb.		@
English	lb.	.12	@ .14
Spanish	lb.	.03½	@ .04½
Oximony	lb.	16	@
Para toner	lb.	1.25	@ 1.50
Spanish natural	lb.	.03½	@ .04½
Toluidine toner	lb.	2.75	@ 3.00
Venetian	lb.	.03½	@ .06
Vermilion, American	lb.	.25	@ .30
English quicksilver	lb.	1.30	@ 1.35
WHITE			
Albalith	lb.	.07¼	@ .07½
Aluminum bronze	lb.		@
Lithopone, domestic	lb.	.06½	@ .07½
Red Seal, imported	lb.	.06¼	@ .06½
Zinc oxide:			
AAA	lb.	.08¼	@ .08½
American Horse Head			
Special	lb.	.08½	@ .09
XX red	lb.	.08	@ .08½
French process, Florence			
Green seal	lb.	.10¾	@ .11¼
Red Seal	lb.	.09¾	@ .10¼
White seal	lb.	.12	@ .12¼
imported	lb.	.12¼	@ .13
Azo (factory):			
ZZZ (lead free)	lb.	.08	@ .08½
ZZ (—5% leaded)	lb.	.07¼	@ .07½
Z (8.10% leaded)	lb.	.07	@ .07½
Zinc sulphide	lb.		@
YELLOW			
Arsenic, yellow	lb.	1.00	@
Cadmium, sulphide, light	lb.		@
Chrome, light and med.	lb.	.20	@ .22
Dipped goods	lb.		@
Gritless yellow	lb.	3.50	@
India rubber	lb.	.87½	@
Ochre, domestic	lb.	.02½	@ .03
imported	lb.	.02¾	@ .03½

Compounding Ingredients

Aluminum flake (carloads)	ton	25.00	@29.00
hydrate, light	lb.	.18	@ .20
Ammonia carbonate	lb.	.07¾	@ .10½
Asbestine (carloads)	ton	13.00	@25.00
Aluminum silicate	ton		@
Barium, carbonate, precip.	ton	69.00	@
dust	ton	100.00	@
Barytes, pure white C. L.	ton	23.90	@
off color (carloads)	ton	20.00	@
uniform floated (carloads)	ton	23.90	@
Basofor	lb.	.04¼	@

Blanc fixe	lb.	$0.04½	@$0.04½
Carrara filler (factory)	lb.	.01¾	@
Chalk, precip. extra light	lb.	.03½	@ .04¼
heavy (f.o.b. factory)	lb.	.02½	@ .03¼
China clay, Dixie	ton	22.00	@32.00
Blue ribbon (carloads)	ton	14.00	@
Blue Ridge	ton	20.00	@30.00
Butcher clay (carloads)	ton	11.00	@25.00
Cotton flock, black	lb.	.12½	@
light-colored	lb.	.12½	@ .15
white	lb.	.15½	@ .19
Cotton linters clean mill-run	lb.	.08	@
Fossil flour (powdered)	ton	60.00	@
(bolted)	ton	60.00	@
Glue, high grade	lb.	.30	@ .40
medium	lb.	.20	@ .26
low grade	lb.	.16	@ .19
Graphite, flake	lb.	.05	@
amorphous	lb.	.05	@
Infusorial earth (powd.)	ton	60.00	@
(bolted)	ton	65.00	@
Mica, powdered	lb.	*.15	@
Pumice stone, powdered	lb.	.03	@ .05
Rotten st., powd. (bbls.)	lb.	.02½	@ .04½
Silica, gold bond (factory)	ton	31.00	@
silver bond (factory)	ton	25.00	@
Soap bark, cut	lb.	.08¼	@ .09
Soapstone, powdered, gray	ton	12.00	@
Sodium bicarbonate (bbls.)	lb.	.02¼	@
Starch, powd. corn (bags)	cwt.	2.82	@ 2.92
(bbls.)	cwt.	3.09	@ 3.19
Talc, soapstone	ton	$22.50	@
Terra blanche	ton		@
Tripoli flour, cream or rose	ton		@
white (factory)	ton		@
Tyre-lith	ton	80.00	@
Whiting, Alba	cwt.		@
chalk	ton	1.15	@ 1.25
commercial	cwt.	1.00	@ 1.25
Danish (factory)	ton	20.00	@
English cliffstone	cwt.	1.25	@ 2.00
gilders (bolted)	cwt.	1.10	@ 1.15
K. T.	ton		@
Paris, white, American	ton	25.00	@
Perfection (carloads)	ton		@
Plymouth	ton		@
Quaker	ton	13.00	@15.00
Superfine, L. H. B.	ton	13.00	@25.00
Wood pulp, XXX	ton	35.00	@
X (f.o.b. factory)	ton	25 00	@

Mineral Rubber

Gilsonite	ton	65.00	@
Genasco (factory)	ton		@
Hard hydrocarbon	ton	33.00	@42.00
Liquid rubber	lb.	.15	@
Soft hydrocarbon	ton	32.50	@38.00
320/340 M. P. hydrocarbon	ton	45.00	@50.00
300/310 M. P. hydrocarbon	ton	40.00	@45.00
Pioneer, M. R., solid (fac.)	ton	42.00	@44.00
M. R. granular	ton	52.00	@54.00
Robertson, M. R., solid	ton	35.00	@75.00
M. R. granular (factory)	ton	54.50	@72.50
Rubrax (factory)	ton	60.00	@
States "A"	ton		@
No. 1	ton		@
Synpro, gran. M. R. (fac.)	ton	55.00	@65.00

Oils

Avoilas compound	lb.	.14	@
Castor, No. 1, U. S. P.	lb.	.14½	@
No. 3, U. S. P.	lb.	.14	@
Corn	lb.	.13	@
Cotton	lb.	.13	@
Cycline	gal.	.35	@

*Nominal.

Glycerine	lb.	$0.18½	@$0.19
Halowax, No. 1000 (500-lb. drums)	lb.	.25	@ .27
No. 1001	lb.	.38	@ .40
Linseed, raw	gal.	1.02	@
Palm lagos	lb.	.09	@ .10
Palm, niger	lb.	.09½	@
Peanut	lb.	.14	@
Petrolatum, standard	lb.		@
Petrolatum, sticky	lb.		@
Pine, steam distilled	gal.	.75	@
Rapeseed, refined	gal.	.90	@
blown	gal.	1.00	@
Rosin	gal.	.38	@
Synpro	gal.		@
Soya bean	lb.	.14	@
Tar	gal.	.26	@

Resins and Pitches

Cumar resin hard	lb.		@
soft	lb.		@
Tar, pine, retort	bbl.	12.00	@
kiln	bbl.	12.50	@
Pitch, Burgundy	lb.	.05	@
coal tar	lb.	.01½	@
Fluxol hardwood	ton	40.00	@60.00
pine tar	lb.	.03	@
ponto	lb.	.07	@
Rosin, K (bbl.)	280 lbs.	6.65	@
strained (bbls.)	280 lbs.	6.60	@
Shellac, fine orange	lb.	*.90	@

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.])	lb.		@
Benzol (90%, drums [7.21 lbs. per gal.])	gal.		@
pure (drums)	gal.	.42	@
Carbon bisulphide (dms. [10.81 lbs. per gal.])	lb.		@
tetrachloride (drums. [13.28 lbs. per gal.])	lb.	.10	@ .10½
Motor gasoline (steel bbls.)	gal.	.24½	@
Naphtha, V. M. & P.	gal.	.23½	@
solvent (drums extra)	gal.	.28	@
Cymene (factory)	gal.	1.50	@
Toluol, pure (7.21 lbs. per gal.)	gal.		@
Turpentine, spirits	gal.	1.56	@
wood, steam distilled	gal.	1.46	@

Substitutes

Black	lb.	.09	@ .13½
Brown	lb.	.09	@ .15
White	lb.	.09½	@ .16½
Brown factice	lb.	.10	@ .16
White factice	lb.	.10	@ .16
T. K. factice	lb.	.14	@ .24

Vulcanizing Ingredients

Black hypo, T. K., S. F.	lb.	.19	@
13%	lb.	.21	@
Sulphur chloride (drums)	lb.	.08	@
(jugs)	lb.	.13½	@
Sulphur, Bergenport brand, 100% pure (bbls.)	cwt.	2.70	@ 3.05
(bags)	cwt.	2.45	@ 2.80
Sulphur flour (bbls.)	cwt.	2.75	@ 3.30
(bags)	cwt.	2.50	@ 3.05
Superfine 100% pure	cwt.		@

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	lb.	.45	@
ceresine, white	lb.	.12	@
carnauba	lb.	.20	@
montan	lb.	.04½	@ .05
ozokerite, black	lb.	.18	@
green	lb.	.27	@
paraffine	lb.	.02⅞	@ .04⅞
sweet wax	lb.	.10	@ .12

Miscellaneous

Saturating material	lb.	.01½	@ .04
Finishing material	lb.	.04	@ .06
Insulating compound	lb.		@
Battery sealing compound	lb.		@

SULZIN, AN INORGANIC ACCELERATOR

A new inorganic accelerator of British origin, known as Sulzin, is said to be free from the many objections incident to the use of many well-known organic accelerators. The special features claimed are: (1) It is inorganic. (2) Its vulcanizing efficiency is equal to that of organic accelerators. Any speed of cure required can be obtained, according to the percentage of Sulzin in the mix. (3) It remains inert until subjected to normal temperature of vulcanization. Its effective accelerating properties begin at 240 degrees F., consequently it does not scorch on the mixing mill nor when left standing in uncured stock, even when left standing for two weeks. (4) It has no unsatisfactory aging effects on finished goods. (5) It imparts no odor. (6) It is nonpoisonous. (7) It adds considerable toughness and strength to the vulcanized product without otherwise affecting its ordinary physical qualities. (8) It is a fine white powder, is easily controlled and uniform in action. Any proportion can be used according to the speed of vulcanization required. (9) The coloring properties of pigments such as antimony sulphide, lithopone, red oxide, etc., are not affected by the presence of Sulzin, nor does their presence affect the efficiency of Sulzin. (11) It can be used without sulphur when sufficient antimony sulphide is present. The rate of after cure in the case of Sulzin is of the same order as when no accelerator is present, which is not so with many organic accelerators.

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